

Diva LAN ISDN Modem

User's Guide

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Overview

Your Diva LAN ISDN Modem is a powerful networking solution for small office/home office users and branch office users. Features include high-speed ISDN Internet access as well as phone and fax support, all in one box. The Diva LAN ISDN Modem will satisfy all your communication needs with a single ISDN line and Internet account, saving you time and money.

Your Diva LAN ISDN Modem simultaneously connects everyone in the office or home to the Internet or a corporate network, as well as local resources such as printers and scanners. It can automatically assign a unique network address to each user, while allowing all users to share the same dial-up account. Connections are dialed automatically upon demand, without the need for special software.

The Diva LAN ISDN Modem's telephone ports allow you to connect phones and fax machines, eliminating the expense of separate analogue lines. Users may send faxes or receive phone calls without interrupting data access, ensuring that important calls aren't missed. Advanced telephone services such as Caller ID, Call Forward, Call Hold and more are supported. You can also put an internal call on hold regardless of the provisioning of your ISDN line.

Designed for non-technical users that don't have support personnel at their disposal, the Diva LAN ISDN Modem installs in minutes and includes many user-friendly features.

The rest of this chapter describes the key features of your Diva LAN ISDN Modem. Installation instructions begin in [Setup](#) on page 15.

Key Features

Your Diva LAN ISDN Modem comes with many important and user-friendly features.

Four Ethernet Ports

The Diva LAN ISDN Modem comes equipped with four Ethernet ports. You can connect up to four network devices (computers, printers, etc.) to create a local area network (LAN). You can also connect one of the Ethernet ports to a network hub to give ISDN access to more than the four devices.

Two Phone Ports

You can connect any type of analog device (telephone, fax machine, analog modem) to the two phone ports, which are on the back of your Diva LAN ISDN Modem. Supplementary telephone services such as Call Waiting, Call Hold, Call Forwarding, Call Transfer, Call Redirection, Caller ID, Distinctive Ring, and others, are also supported.

Total network security

The Network Address Translation (NAT) feature keeps local IP addresses hidden so that your computers are invisible to the outside world. Password security and filtering prevent intruders from breaking into the Diva LAN ISDN Modem itself.

Compression for faster throughput

The Diva LAN ISDN Modem provides data compression to achieve throughput rates of up to 512 kbps, four times the ISDN remote access speed of 128 kbps.

Bandwidth on-demand

The Diva LAN ISDN Modem's bandwidth-on-demand feature automatically monitors data traffic and engages the second B-channel only when needed, reducing ISDN costs.

Advanced ISDN tariff management

The Diva LAN ISDN Modem can be configured to:

- Disable ISDN access during peak tariff rates or limit the total line usage in minutes for a given time period.
- Set a maximum number of connections for a given period.
- Filter out specific IP protocols which consume a lot of bandwidth.
- Control broadcast traffic such as NetBEUI and TCP from reconnecting the ISDN line.

Advanced diagnostics

- On-screen display of device status.
- Significant events are recorded in the device log.
- Events can be set to trigger visual or audible alarms.
- Common errors are described in non-technical language inside the Diagnostic Log, so that users don't need to analyze PPP or ISDN traces.
- Detailed ISDN information for the last two calls is retained.
- Calls are logged separately in the Call Log.
- Reports list ISDN diagnostics in plain language along with help information. This is particularly useful for solving ISDN line provisioning problems.

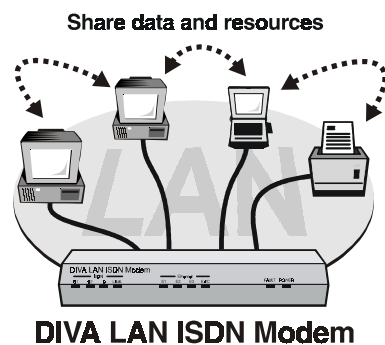
- Detailed traces (including ISDN (Q.931), PPP, X.25, LAPD) are available enabling technical personnel to isolate complex communications problems.

Application Scenarios

Your Diva LAN ISDN Modem can be used in a variety of applications. This section presents a brief overview of some of the more common ones and their features.

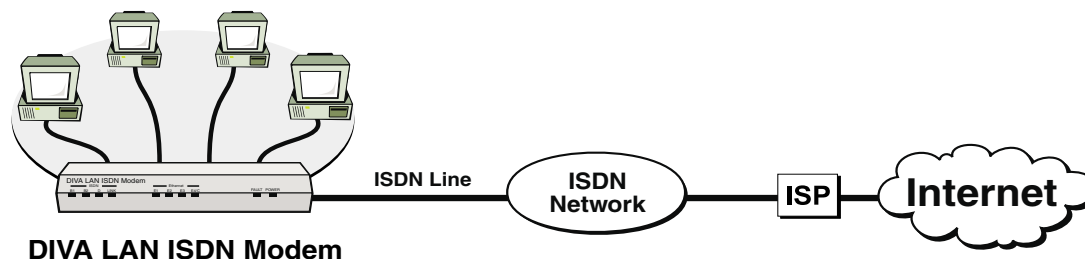
Creating your own LAN for resource sharing

The Diva LAN ISDN Modem has a built-in 10 Mbps Ethernet hub with four ports. By connecting computers (or other devices, such as printers) to these ports, they become part of a LAN and can share data and resources with each other.



Connecting to the Internet

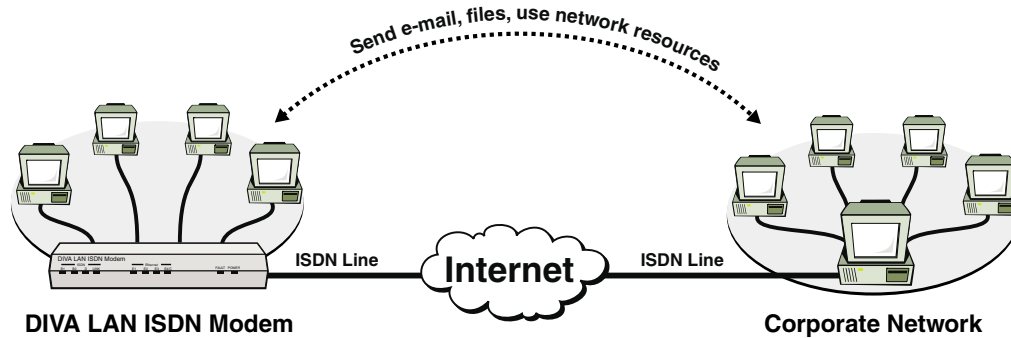
In this application, the Diva LAN ISDN Modem enables you to connect one or more computers to the Internet for e-mail, web surfing, and file transfers.



How it works: You connect the Diva LAN ISDN Modem to an ISDN line (which is part of the telephone network). You also set up an account with an ISP (Internet Service Provider), obtaining the necessary phone numbers, user name, and password. Once the Diva LAN ISDN Modem is configured with this information, it automatically calls the ISP and uses its services to send and receive data on the Internet.

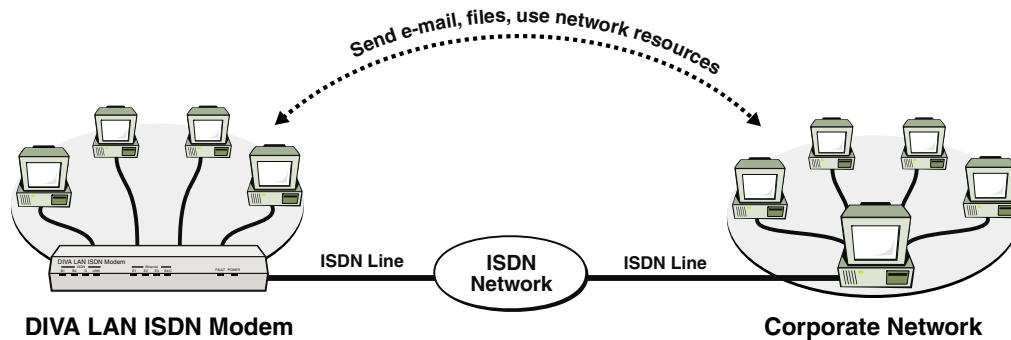
Creating a Virtual Private Network

Connect branch offices and telecommuters into an enterprise-wide Virtual Private Network (VPN) over the Internet. This eliminates the long-distance charges, network management problems, and security responsibilities associated with traditional WANs.



Dialing directly into a corporate network

This option enables you to connect one or more computers to your corporate LAN for file sharing, e-mail, data transfer. Generally, this type of connection takes place via a direct, dial-up link with the corporate LAN.



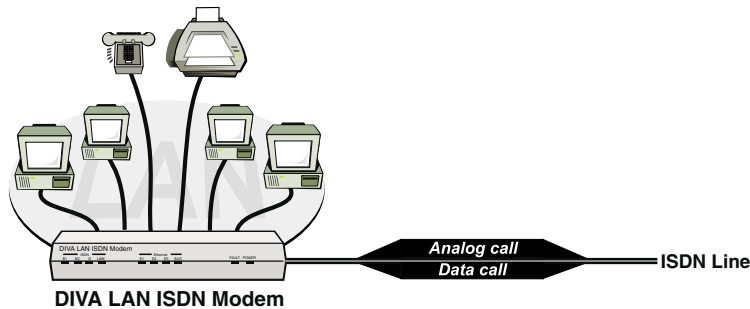
How it works: You connect the Diva LAN ISDN Modem to an ISDN line (which is part of the telephone network). You also contact the corporate network and obtain its ISDN phone number and associated user names and passwords. Once the Diva LAN ISDN Modem is configured with this information, it automatically calls the remote site to send data to it, for example, when a local users sends e-mail, or shares folders with Windows Network Neighborhood.

You cannot connect to a corporate network if it is also using a Diva LAN ISDN Modem.

Attaching telephones and fax machines

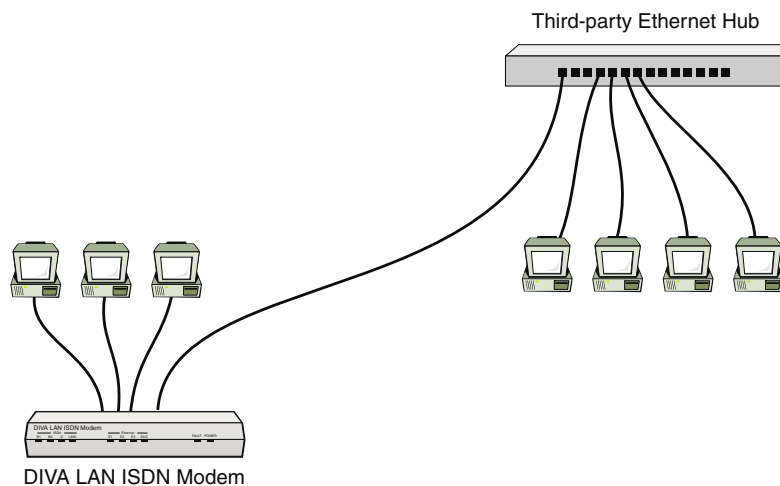
You can connect telephones, fax machines, and analog modems to the Diva LAN ISDN Modem. The Diva LAN ISDN Modem takes advantage of the flexibility of ISDN to enable you to make or receive phone calls or faxes, while at the same time connecting to the Internet or a corporate network with your computers. This can eliminate the need to install additional analog phone lines.

You can connect any type of analog device (telephone, fax machine, analog modem) to these ports. Supplementary telephone services such as Call Waiting, Call Hold, Call Forwarding, Call Transfer, Call Redirection, Caller ID, Distinctive Ring, and others are also supported.



Connecting more than four computers

By attaching a Diva LAN ISDN Modem to a third-party Ethernet hub, you can connect more than four computers (or other devices), enabling them to share the ISDN connection.



In the above example, all computers can share the ISDN link to exchange data, send e-mail, or surf the Web. There is no need for multiple modems, phone lines, or ISP accounts.

Note: Two Diva LAN ISDN Modems cannot be connected in this manner.

Specifications

Physical characteristics

- Ethernet hub with four ports
- Two analog ports
- Indicator lights on the front of the device
- ISDN port
- Power connector
- Console port (for advanced configuration only)

ISDN support

- Available with S/T interface only
- Support for international switches

Voice call handling

- Call bumping (Dynamic Bandwidth Allocation) on incoming and outgoing analog calls
- Advanced calling features, including call forwarding, three-way calling, etc.
- REN of 3 for each phone port

PPP features

- PPP, Multilink PPP, BACP, V.120
- Compression: Ascend, MPPP, MS-STAC, STAC1, and STAC3
- Authentication: PAP/CHAP, MS-CHAP

Installation

- Quick install via wizards
- Auto detection of common problems, including line presence, incorrect configuration, etc.

Usage/tariff management

- Connectivity timers to restrict usage to particular days and times
- Usage limits can be set based on number of calls or time connected
- Call filtering

LAN protocol

- Supports static and dynamic IP routing
- Supports IP PAT and NAT
- Can act as a DHCP server

Administration

- Web-based configuration interface
- Configure using IP via the Ethernet or ISDN ports
- Statistics with real-time updates
- Ability to save and restore configuration locally or remotely

Power Adapter

- External AC wall mount adapter providing 12-16V
- Power consumption: 10 Watts maximum

Setup

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Overview

The sections in this chapter explain how to install and configure the Diva LAN ISDN Modem for a variety of situations.

Important: For your safety, follow the instructions exactly as they appear.

Before you start the setup process, be sure to read the section [Before you Begin](#) on page 17, which contains important information that will help ensure a smooth installation.

Before you Begin

Before you begin, do the following:

- **Gather Configuration Information** 17
- **Verify Package Contents** 18
- **Verify Computer Configuration** 18
- **Review Location of Device Ports** 19
- **Review Connection Scenarios** 19

Gather Configuration Information

The following information will be needed to complete the setup process.

ISDN Phone Numbers

Your ISDN provider will assign one or more ISDN numbers to your ISDN line. These numbers are used by the Diva LAN ISDN Modem to identify itself on outgoing calls (both data and analog) and to receive incoming analog calls.

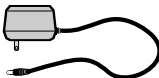
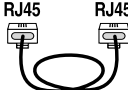
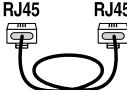
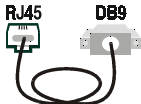
Internet Account Information

To connect to the Internet, you must acquire an account with an Internet Service Provider (ISP). Your ISP will supply the following information.

- **ISP ISDN Numbers:** These are the numbers you will use to dial into in order to gain Internet access. Your ISP may supply a backup number in case the primary number is unavailable.
- **User name and Password:** The user name and password are assigned by your ISP and are used when logging in to your provider's system.
- **DNS Numbers (Primary and Secondary):** Your computer must reference your ISP's DNS server in order to find sites on the Internet. In most cases, the Diva LAN ISDN Modem will automatically discover these addresses. However, if the Diva LAN ISDN Modem is unable to do so, you will have to enter them manually. DNS server addresses consist of four numbers separated by periods. Each number can be from 0 to 255 (213.121.098.111 for example).

Verify Package Contents

Your package should contain the following:

Diva LAN ISDN Modem 	Power Adapter 
Ethernet Cable (Blue) 	ISDN Cable 
Quick Install Guide 	CD-ROM 
Phone Adapter In certain countries, a phone adapter is provided so that telephone devices can be plugged into the RJ11 connectors on the back of the Diva LAN ISDN Modem.	Console Cable  (Advanced configuration only)

Verify Computer Configuration

Each computer that will be connected to the Diva LAN ISDN Modem must have:

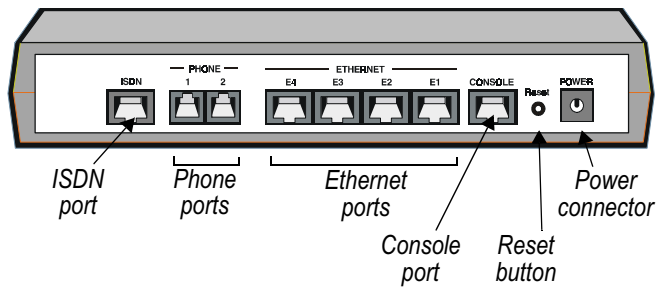
- **A 10BASE-T Ethernet network interface card**, properly installed and configured to use the TCP/IP protocol. Consult the documentation that came with your card for instructions on how to do this. 100 Mbps Ethernet cards can only be connected to the Diva LAN ISDN Modem if they support auto-sensing.
- **TCP/IP communications protocol** configured to obtain its IP address automatically (DHCP client), and not configured to use a DNS server. See [Verifying TCP/IP Settings](#) on page 36 for information on configuring TCP/IP.

The computer you are going to use to configure the Diva LAN ISDN Modem must have:

- **Web browser software** (Netscape Navigator 3.01 or later, or Internet Explorer 4 or later). Internet Explorer is included on the Diva LAN ISDN Modem CD for computers running Windows. Windows NT 4.0 requires SP3 or later, available from <http://www.microsoft.com>. The Web browser must be configured to connect to the Internet via a local area network (LAN) and not through a proxy server.
- **Microsoft Windows** (Windows 95/98/NT4/2000/Me), *if* you are going to use the Diva Assistant software. This software, included on the CD-ROM, provides a convenient way to manage the Diva LAN ISDN Modem and is useful when configuring the device over a LAN for the first time. You are **not** required to use this software, but it does make installation and setup easier.

Review Location of Device Ports

Your Diva LAN ISDN Modem contains several ports on the back of the device. Take a few minutes to become more familiar with what each port is used for.



Note: Certain Diva LAN ISDN Modem models are not equipped with phone ports.

Port Descriptions

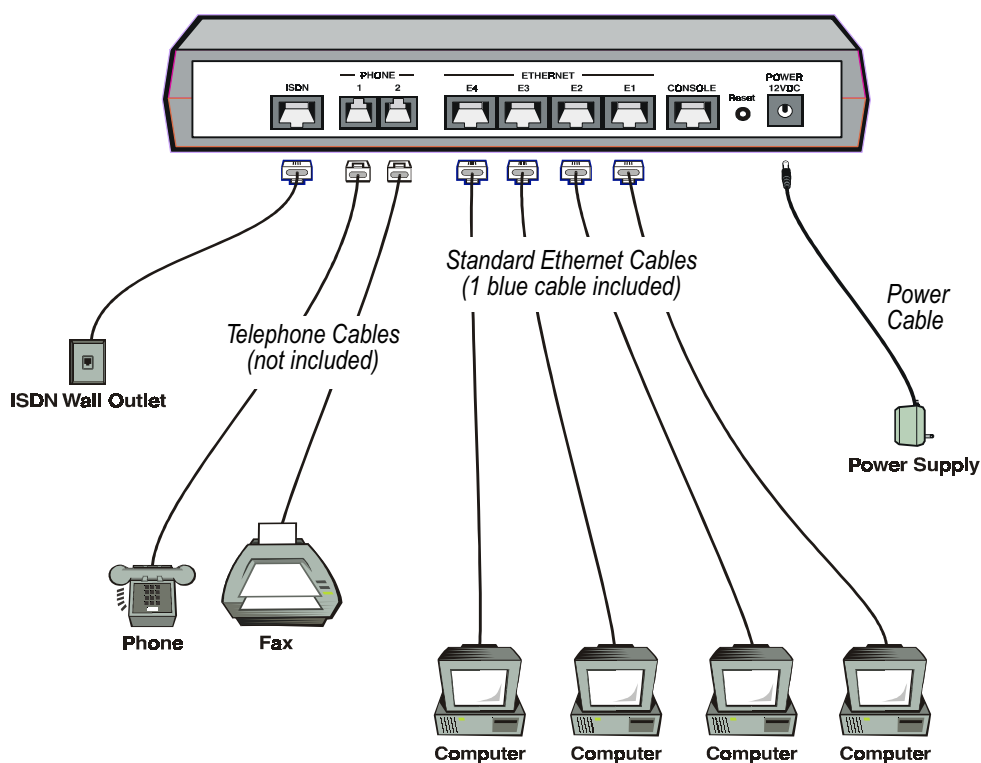
ISDN	Used for connecting your Diva LAN ISDN Modem to the ISDN network.
Ethernet	Used for connecting computers or other network-enabled devices.
Phone	Used for connecting analog devices such as telephones and fax machines.
Power	Used for connecting the Diva LAN ISDN Modem to an electrical outlet.
Console	Do not use this connector; it is for advanced setup only.
Reset button	Used for resetting the Diva LAN ISDN Modem. Pressing this button once resets the device. Warning! All configuration settings are lost if you hold down the Reset button for 15 seconds. This resets the device back to factory defaults.

Review Connection Scenarios

The Diva LAN ISDN Modem is equipped with four Ethernet ports. You may connect up to four network devices (computers, printers, etc.) and in doing so create your own local area network. You can also connect one of the Ethernet ports to a hub in order to accommodate more than four network devices.

The phone ports are available on the back of your Diva LAN ISDN Modem, next to the Ethernet ports. You can connect any type of analog device (telephone, fax machine, analog modem) to these ports.

Below is an overview of the available connectors. During first-time setup, it is recommended that you connect one computer only to ensure proper operation, then connect the rest of your equipment.

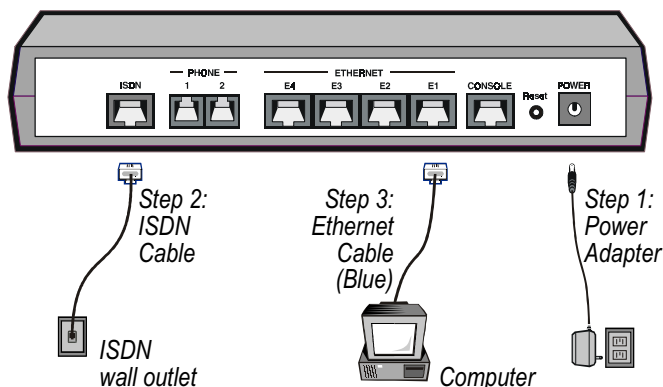


Step 1: Connect the Cables

This procedure will describe how to connect one computer to the Diva LAN ISDN Modem to get everything running properly with minimum steps. You can then connect other computers or your analog equipment.

Your Diva LAN ISDN Modem package includes one Ethernet cable (the blue cable). This is a standard, straight-through cable. If you plan to connect more than one computer to the Diva LAN ISDN Modem, you will need to acquire a separate standard Ethernet cable for each piece of equipment.

Installation Diagram



Note: The Diva LAN ISDN Modem depicted above has two phone ports. Certain models are not equipped with phone ports.

Procedure

Note: For your safety, connect the power adapter before connecting the other cables.

Leave your computer on during installation.

1. Connect the power adapter.

Connecting the power adapter first allows you to see the status indicators for the other cables. When connected, the Power indicator light (on the front of the device) should turn on.

2. Connect the ISDN cable.

Once connected, the D and LINK status lights (on the front of the device) should start flashing. This indicates that the Diva LAN ISDN Modem is attempting to synchronize with the ISDN network. When solid, synchronization has been established.

These two lights may go off when the line is not in use, as many ISDN networks disconnect to conserve power.

3. Connect the Ethernet cable.

The Ethernet cable plugs into the Ethernet port of your computer. Plug the other end into your Diva LAN ISDN Modem. It does not matter which Ethernet port you use.

Once connected, the Ethernet status light for the connected port should light up, indicating that the Ethernet cable is connected properly.

Note: The Diva LAN ISDN Modem has a port labelled 'Console' between the Ethernet ports and the power connector. Do not use this port.

4. Verify your TCP/IP settings, if required.

TCP/IP for your Ethernet card should be configured to acquire its IP address from a DHCP server. If required, restart your computer so that the new settings take effect.

Ethernet cards are normally set to this way by default. See the User's Guide for details on how to do this, or consult the help included with your operating system.

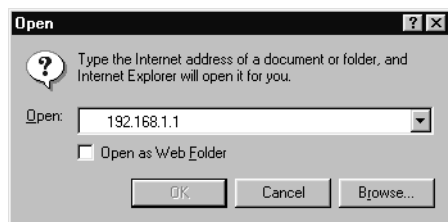
5. To continue, see [Step 2: Log in to the Web Interface](#) on page 23.

Step 2: Log in to the Web Interface

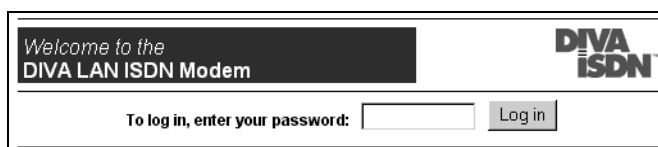
All settings are configured via a series of web pages stored on the Diva LAN ISDN Modem itself. These web pages are accessed through a web browser (Internet Explorer 4.0 or Netscape Navigator 3.0, or later versions, required). In order to configure your Diva LAN ISDN Modem, you must access the device through your browser, then log in.

Logging In

1. Launch your browser.
2. Click 'File', then 'Open'.
3. Type **192.168.1.1** and click 'OK'.



4. The 'Log in' page should appear.



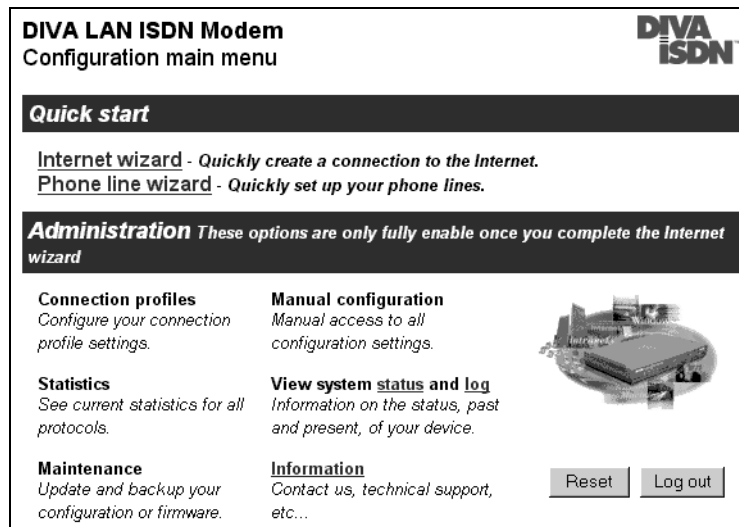
Note: If you do not see the 'Log In' page, see [Troubleshooting](#) for help.

5. Click 'Log In'. By default there is no password.
6. When accessing the configuration pages for the first time, you will next be asked to specify your region. Click 'OK' after making your choice.



If your region does not appear in the list, choose International (the last entry in the list).

7. The main menu appears.



Note: Most links will not be available until you complete the Internet Wizard.

8. To continue, see [Step 3: Internet Wizard](#) on page 26.

Troubleshooting

If the 'Login' page does not appear, try the following:

- Verify that all cables are connected properly.
- Make sure your Ethernet card is set to get its IP address from a DHCP server. If required, restart your computer so that the new settings take effect. See the User's Guide for details on how to do this, or consult the help included with your operating system.
- Make sure your web browser is configured to use the LAN and not a dial-up connection, and that your browser is not set to use a proxy server. See [Adjusting Browser Settings](#) (below) for instructions on how to do this.
- Change the IP address of your computer manually to 192.168.1.2, restart, and try again. This puts your computer on the same subnet as the Diva LAN ISDN Modem. However, this is not the preferred setup method.
- The device IP address is a setting stored on the device and can be changed. Verify that you are using the correct IP address (the default is 192.168.1.1).

Adjusting Browser Settings

If you are not able to access the configuration pages, verify your browser settings as described below. Note that the steps may vary slightly depending on the browser version used.

- Internet Explorer version 5 or later:
 - From the 'Tools' menu, select 'Internet Options', click the 'Connections' tab, then click 'Setup'.
 - Select the option 'I want to set up my Internet connection manually', then click 'Next'.
 - Select 'I want to connect through a local area network', then click 'Next'.
 - Clear all proxy options, then click 'Next'.
 - Clear the option 'Connect to the Internet immediately', then click 'Finish'.
- Internet Explorer previous to version 5:
 - From the 'View' menu, select 'Internet Options', then click the 'Connection' tab.
 - Verify that 'Connect to the internet using a local area network' is enabled.

- Verify that the ‘Proxy Server’ option is disabled.
- Netscape Navigator (do one of the following):
 - Under Options, click ‘Network Preferences’, then ‘Proxies’. Verify that the ‘No Proxies’ option is selected.
 - Under the ‘Edit’ menu, click ‘Preferences’, ‘Advanced’, then ‘Proxies’. Verify that the ‘Direct Connection to the Internet’ is enabled.

Once finished making changes, click ‘OK’, then retry accessing the web-based configuration pages.

Step 3: Internet Wizard

The Internet Wizard consists of a series of web pages designed to help you quickly and easily input your Internet connection settings (such as your username and password). The wizard will then test if your settings are correct.

Completing the Internet Connection Wizard

1. From the main menu, click the 'Internet Wizard' link.

The first page of the wizard ('Network Setup') appears. Fill in all the required fields. Brief explanations are provided below.

Internet Connection Wizard **Internet Network Setup** ?

1. Network Setup
2. Cost Control
3. Review & Save
4. Test & Connect

Specify the name to assign to this profile. Profile name:
ISP

Specify the phone number(s) of your ISP's ISDN service. Primary telephone number:
Backup telephone number:

Check this box if you want to connect to Compuserve using V.120. Compuserve (V.120):
☐

Specify account information to logon to your ISP. User name:
Password:

Specify these DNS addresses if required by your ISP. Primary DNS IP address:
0.0.0.0
Secondary DNS IP address:
0.0.0.0

Reset form Cancel Next

- A** Enter your ISP's ISDN phone numbers in these fields.
- B** Check this box if you intend to use Compuserve as your Internet provider, with a V.120 connection.
- C** Enter your user name and password in these fields. Be careful to use upper- and lowercase where required.
- D** If your ISP supplied DNS server addresses, enter the addresses in these fields. If not, leave these addresses as 0.0.0.0. When set to 0.0.0.0, the Diva LAN ISDN Modem will discover these addresses automatically (must be supported by your ISP).

Note: Do not change the profile name.

2. Click 'Next'. The 'Cost Control' page appears.

These settings are designed to assist you in ensuring that your ISDN line is not accidentally used by your applications. Read the onscreen instructions carefully and, if necessary, adjust your settings.

The screenshot shows the 'Internet Connection Wizard' window with the 'Cost Control Setup' tab selected. On the left, a sidebar lists four steps: 1. Network Setup, 2. Cost Control (highlighted), 3. Review & Save, and 4. Test & Connect. The main area contains a 'WARNING' message about ISDN line usage, followed by two explanatory paragraphs about the 'Maximum Number of Calls' and 'Maximum Duration of Calls' settings. To the right, there are three settings: 'Enable data call threshold monitoring?' with a checked checkbox, 'Threshold monitoring interval:' set to 1 Days, 'Maximum number of calls:' set to 50, and 'Maximum duration of calls:' set to 4 Hours. At the bottom, there are four buttons: 'Reset form', 'Cancel', 'Back', and 'Next'.

3. Click 'Next'. The 'Review and Save' page appears.

The screenshot shows the 'Internet Connection Wizard' window with the 'Review & Save' tab selected. The sidebar on the left shows the same four steps, with '3. Review & Save' now highlighted. The main area displays a summary of the configuration: 'Setup is ready to create a connection with the following characteristics.' followed by 'Primary telephone number: 7110511', 'Backup telephone number:', 'Username: Edwin', 'Password: *****', 'Primary DNS address: 0.0.0.0', and 'Secondary DNS address: 0.0.0.0'. Below this, there are three bullet points providing instructions on how to proceed. At the bottom, there are three buttons: 'Back', 'Save', and 'Save + Test'.

4. If the Diva LAN ISDN Modem is connected to your ISDN line, click 'Save + Test' (otherwise, just click 'Save').

The 'Save + Test' option will validate your configuration and point out any errors.

The screenshot below reports a successful test.



When a test fails, the Internet wizard provides a link to the settings that are suspected to be in error. Click on the link to make your corrections.

5. Click 'Done'. You are returned to the main menu.

Setup Complete!

Once you have successfully set up Internet access, initial setup is complete! We suggest you use your Internet access to visit the Eicon Networks website (<http://www.eicon.com/>), where you can register your Diva LAN ISDN Modem.

You also may want to connect other equipment. See [Connecting Analog Phone Equipment](#) on page 34 for more information.

Optional: Installing Diva Assistant

The DIVA Assistant provides a convenient tool for managing your Diva LAN ISDN Modem. You can do many things without having to log on to the web interface, including backing up configuration, updating firmware, and dialing or hanging up calls.

Note: *Diva Assistant is for use on Windows 95/98/NT4/2000/Me.*

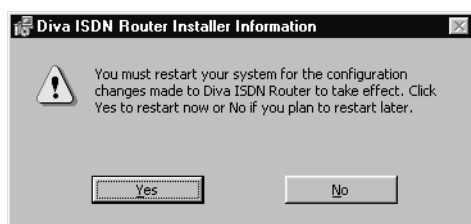
The DIVA Assistant includes the Network Wizard, which is especially useful for setting up the device on a LAN.

Installing the DIVA Assistant

1. Quit all open applications. You must restart your computer once installation is complete.
2. Insert the Diva CD-ROM into your CD-ROM drive. The setup program should start automatically and the following welcome screen should appear. (If not, double-click 'SETUP' in the CD's root folder.)
3. From the 'Welcome' screen, click 'Software / Documentation'.
4. Click 'Install Diva Software'. The setup wizard starts.



5. Click 'Next' and follow the onscreen instructions.
6. When installation is complete and you click 'Finish', you will see a message stating that you must restart your computer before launching the software. Click 'Yes'.



You may encounter problems with the Diva Assistant if you do not restart your computer after installation.

Once you have restarted, the Diva Assistant icon will appear in the Windows system tray.

For an introduction to the using the DIVA Assistant, see [Diva Assistant \(Windows Only\)](#) on page 47.

Removing the Diva Assistant

To remove the Diva Assistant:

1. Click 'Start', 'Settings', 'Control Panel'.
2. Double-click 'Add/Remove Programs'.
3. From the 'Install/Uninstall' tab, scroll down the list and select 'Diva ISDN Router'
4. Click the 'Add/Remove' button and follow the onscreen instructions.

LAN Setup

Installing the Diva LAN ISDN Modem on an existing LAN can be extremely simple or quite challenging, depending on the complexity of your existing LAN setup.

To help you successfully integrate the Diva LAN ISDN Modem into your setup, this LAN installation section presents strategies that should work in the majority of cases. However, due to the wide range of networking equipment and topologies that are in use worldwide, your configuration needs may fall outside the strategy presented here.

If in doubt, contact your network administrator (or other support personnel) to help you with your installation.

About the Ethernet Cable

The blue Ethernet cable included with your package is a **standard, straight-through** Ethernet cable and is used to connect the Diva LAN ISDN Modem directly to a network hub. Do not use the crossover adapter included with your package.

Using the Diva Assistant to set up over a LAN

For many LAN setups, if you are not using the Diva LAN ISDN Modem as a DHCP server, the first setting that must be changed once you log in is the **LAN IP address** of the device.

The default LAN IP address for the Diva LAN ISDN Modem is 192.168.1.1. Normally, in order to contact the Diva LAN ISDN Modem through TCP/IP, your computer's IP address must be on the same subnet as the device. For example, your computer could be set to 192.168.1.2 and subnet mask set to 255.255.255.0.

If at least one computer on your LAN uses Windows, install the Diva Assistant on that computer and use it to contact and configure the Diva LAN ISDN Modem. The Diva Assistant has a special feature that allows it to communicate with the Diva LAN ISDN Modem over a network, without having to change the computer's TCP/IP settings.

Once the Diva Assistant has detected the Diva LAN ISDN Modem, you will be asked if you want to change its IP address.

General Setup Procedure

The following is a general guideline for the setup procedure you must follow when setting up over a LAN.

1. Connect the Diva LAN ISDN Modem to the hub on your LAN.
2. If you must change the LAN IP address of the device, and a computer using Windows is available on the LAN, install the Diva Assistant as described in [Optional: Installing Diva Assistant](#) on page 29.

Once installation is finished and you have restarted your computer, right-click on the Diva Assistant icon in the system tray, then select 'Network Wizard'. Follow the on-screen instructions. Once the Diva Assistant has detected the Diva LAN ISDN Modem, you will be asked if you want to change its IP address.

3. Contact the Diva LAN ISDN Modem as described in [Step 2: Log in to the Web Interface](#) on page 23.

Remember that, to contact the Diva LAN ISDN Modem at its default IP address of 192.168.1.1, your computer must be on the same subnet (assigned an IP address of 192.168.1.x). If you are using the Diva LAN ISDN Modem as your DHCP server, you must acquire a new IP address before attempting to contact the device. If your LAN has an existing DHCP server or if the LAN uses static IP addresses, you must manually change the IP address

of your computer to 192.168.1.2 (or 192.168.1.3, etc.) and subnet mask to 255.255.255.0, before contacting the Diva LAN ISDN Modem.

Once you have contacted the device and logged on, you can change the device IP address so that it Diva LAN ISDN Modem matches those on your LAN (see “IP Addressing” on page 32 for more information).

Note: If you are successful in contacting the Diva LAN ISDN Modem over a LAN, use a single non-networked computer for initial configuration, as described in [Step 1: Connect the Cables](#) on page 21.

4. Complete the Internet Wizard as described in [Step 3: Internet Wizard](#) on page 26, then verify that the Internet is accessible from the required machines.

Note: Depending on your LAN setup, you may need to restart other machines on the LAN before Internet access is available.

5. Adjust other LAN settings, such as those on a router or on the Diva LAN ISDN Modem itself.

Built-in DHCP Server

The Diva LAN ISDN Modem has a built-in DHCP server. When you drop the Diva LAN ISDN Modem into a LAN, the Diva LAN ISDN Modem senses if another DHCP server exists and de-activates its own DHCP services. To re-activate the DHCP server, disable the other server, then press the Reset button on the back of the Diva LAN ISDN Modem.

If you are planning on using the Diva LAN ISDN Modem as the DHCP server for your LAN, make sure each computer is set up to acquire its IP address dynamically.

IP Addressing

If your LAN uses static IP addressing, or if you are using an existing DHCP server, you must assign the Diva LAN ISDN Modem a unique LAN IP address. To change this setting:

1. Access the web interface.
2. Click ‘Manual Configuration’.
3. Click ‘LAN’.
4. Enter a new IP address in the ‘LAN IP Address’ field. If required, enter a new subnet mask as well..

The screenshot shows a web interface for configuring LAN parameters. The title is "LAN parameters" and the sub-header is "Edit LAN parameters". There are two main sections: "LAN parameters" and "RIP parameters". In the "LAN parameters" section, the "IP address" field is set to "192.168.1.1" and the "Subnet mask" field is set to "255.255.255.0". In the "RIP parameters" section, the "RIP version" dropdown is set to "V.2, compatible to V.1", the "Route merging?" checkbox is unchecked, and the "RIP policy" dropdown is set to "Periodic". At the bottom of the form are three buttons: "Cancel", "Reset form", and "Save". An arrow points from the text "LAN IP address" to the "IP address" field.

Note: This step is done automatically if the Diva Assistant is used. See [Using the Diva Assistant to set up over a LAN](#) on page 31 for more information.

Once you click ‘Save’, you will lose contact with the device. To re-access the web interface, click ‘File’, ‘Open’ in your web browser, then enter the new IP address. You may need to change the TCP/IP settings on your computer before being able to access the Diva LAN ISDN Modem after the IP address has been changed.

However, if your computer is set to acquire its IP address dynamically from a DHCP server, you need only restart your computer (or reset the IP address manually using 'winipcfg' with Windows 9x or 'ipconfig /renew' for Windows 2000/NT). The Diva LAN ISDN Modem will assign the new address.

Adjusting LAN Settings

If your LAN uses static addressing

If your LAN uses static addressing, you must configure the TCP/IP settings on each computer. Specifically, set each computer's 'Default Gateway' and 'DNS Server' settings to the address of the Diva LAN ISDN Modem.

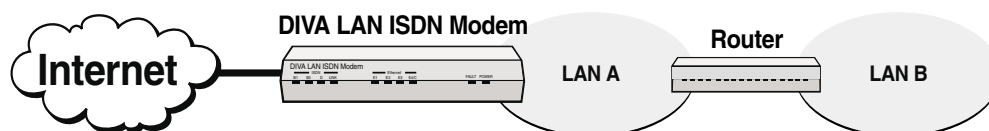
If your LAN has a DHCP server

If your LAN has a DHCP server, configure your DHCP server to return the address of the Diva LAN ISDN Modem as the 'Default Gateway' and 'DNS Server' to all clients.

If your LAN has a router

If you have a router on your LAN, it is likely configured as the default gateway for your computers. In this case, you will need to configure the routing table on your router to re-direct the appropriate traffic to the Diva LAN ISDN Modem. You must also add a route on the Diva LAN ISDN Modem to direct appropriate traffic to the router.

Consider the following example:



Traffic from LAN A addressed to LAN B is forwarded by the router to LAN B.

Traffic from LAN A addressed to the Internet needs to be forwarded by the router to the Diva LAN ISDN Modem. This requires you to configure a route on the router.

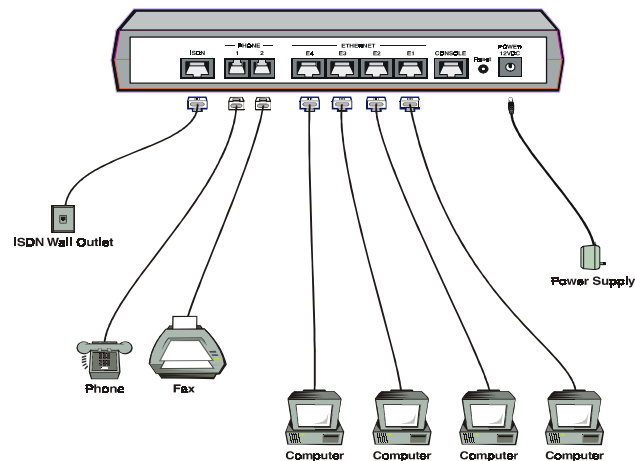
Traffic from the Internet to LAN B needs to be forwarded to the router. This requires you to configure a route on the Diva LAN ISDN Modem. No route is needed for traffic to LAN A.

See [IP Routes](#) on page 147 for more information on this topic.

Connecting Supplementary Equipment

Once you have one computer connected to the Diva LAN ISDN Modem, you may connect additional equipment, such as more computers or analog phone equipment, to the available ports on the Diva LAN ISDN Modem.

- [Connecting up to Four Computers](#) 34
- [Connecting Analog Phone Equipment](#) 34



Connecting up to Four Computers

You can connect up to four computers to the Diva LAN ISDN Modem. In this case, the Diva LAN ISDN Modem acts as a DHCP server, assigning IP addresses dynamically to each device. You can also connect printers or other Ethernet network devices so that they are accessible by other computers connected to the Diva LAN ISDN Modem.

Note: You must acquire additional standard, straight-through Ethernet cables in order to connect more computers to the Diva LAN ISDN Modem. Your package comes with one Ethernet cable only.

To connect additional computers:

1. Connect your straight-through Ethernet cable to an available Ethernet port on the back of the Diva LAN ISDN Modem. Connect the other end of the cable to the Ethernet port on your computer.

Once connected, the Ethernet status light for the connected port should light up, indicating that the Ethernet cable is connected properly.

2. Prepare the computer as described in [Verify Computer Configuration](#) on page 18 and [Verifying TCP/IP Settings](#) on page 36.
3. Restart your computer, if required.

Once this procedure is complete, you should be able to access the Internet through the Diva LAN ISDN Modem from each newly-connected computer. Launch your application (a web browser for example) and the connection is established automatically.

Connecting Analog Phone Equipment

If your Diva LAN ISDN Modem is equipped with phone ports, you can connect analog devices, such as telephones or fax machines, to the phone ports.

In certain countries, you must plug the cable from your analog device into a phone adapter before connecting it to the Diva LAN ISDN Modem.

Telephones and fax machines you connect to the Diva LAN ISDN Modem should work without any further configuration. However, you can fine-tune the behavior of analog devices. For example, you can specify which ports should answer which phone numbers. To do this, access the Diva LAN ISDN Modem web configuration pages and click 'Phone Line Wizard'.

For information on changing these settings, see [Phone Settings and Number Assignments](#) on page 85.

Verifying TCP/IP Settings

For most connection scenarios, your computer must have TCP/IP configured to act as a DHCP client. This allows your computer to dynamically acquire its IP address and other settings from the Diva LAN ISDN Modem.

The following procedures describe how to set your TCP/IP settings for Windows 95, Windows 98, Windows NT[®] 4.0, Windows 2000, and Macintosh[®] (Mac OS 8). For other platforms, consult the documentation for your operating system.

- [TCP/IP Settings for Windows 95/98](#) 36
- [TCP/IP Settings for Windows NT 4.0](#) 37
- [TCP/IP Settings for Windows 2000](#) 38
- [TCP/IP Settings for Macintosh \(Mac OS 8 or later\)](#) 38

If you do not want to use the DHCP feature of the Diva LAN ISDN Modem, you must change the IP address of your computer to match that of the device. For example, the default IP address for the device is 192.168.1.1. You must then change the IP address of your computer to 192.168.1.2, or 192.168.1.3, etc.

TCP/IP Settings for Windows 95/98

The following procedure describes how to verify and install TCP/IP on Windows 95 or Windows 98. If TCP/IP is already installed on your system, go to [Configuring TCP/IP](#) (below). Note that if you have more than one Ethernet adapter installed on your system, you must only change the settings for the adapter used by the Diva LAN ISDN Modem.

Procedure

1. Click 'Start', 'Settings', 'Control Panel'.
2. Double-click the 'Network' icon. The 'Network' dialog box appears. By default, the 'Configuration' tab is displayed.
 - If 'TCP/IP' is not listed for your network adapter in the 'Components' list, go to [Installing TCP/IP](#) (below).
 - If 'TCP/IP' is listed for your network adapter in the 'Components' list, then the protocol is already installed. Go to [Configuring TCP/IP](#) (below).

Installing TCP/IP

1. Click 'Add'. The 'Select Network Component Type' dialog box appears.
2. Select 'Protocol', then click 'Add'. The 'Select Network Protocol' window appears.
3. In the 'Manufacturer' box, select 'Microsoft'[®]. In 'Network Protocols', select 'TCP/IP'.
4. Click 'OK'. Once installation is complete, you are returned to the Network window.
5. Do not click the 'OK' button yet; next you will verify your TCP/IP settings. Go to [Configuring TCP/IP](#) (below).

Configuring TCP/IP

1. In the list of components, select 'TCP/IP' for your network card, then click 'Properties'. The 'TCP/IP Properties' dialog box appears.

2. Click the 'IP Address' tab and select 'Obtain an IP address automatically'. This defines your machine as a DHCP client.
3. Click the 'WINS Configuration' tab and select 'Use DHCP for WINS Resolution'.
4. Click the 'Gateway' tab and remove all existing gateways.
5. Click the 'DNS Configuration' tab and select 'Disable DNS.' This instructs your computer to obtain DNS server information via DHCP.
6. Click 'OK', then click 'OK' again.

Note: You may be asked to insert your original Windows installation CD-ROM.

7. Click 'Yes' when prompted to restart your system.

TCP/IP Settings for Windows NT 4.0

The following procedure describes how to install TCP/IP on Windows NT 4.0. If TCP/IP is already installed on your system, see [Configuring TCP/IP](#) (below). Note that if you have more than one Ethernet adapter installed on your system, you must only change the settings for the adapter used by the Diva LAN ISDN Modem.

Procedure

1. Click 'Start', 'Settings', 'Control Panel'.
2. Double-click the 'Network' icon. The Network dialog box appears.
3. Click the 'Protocols' tab.
 - If 'TCP/IP' is not listed, go to [Installing TCP/IP](#) (below).
 - If 'TCP/IP' is listed, then the protocol is already installed. Go to [Configuring TCP/IP](#) (below).

Installing TCP/IP

1. From the 'Protocols' tab, click 'Add'.
2. Select 'TCP/IP protocol' as your network protocol, then click 'OK'.
3. Click 'Yes' to use DHCP.
4. When prompted, insert the original Windows NT installation CD and enter **d:\i386** (where d: is the drive letter of your CD drive), and click 'Continue'.
5. Do not click the 'OK' button yet; next you will verify your TCP/IP settings. Go to [Configuring TCP/IP](#) (below).

Configuring TCP/IP

1. Click the 'Protocols' tab.
2. Select 'TCP/IP protocol', then click 'Properties'.
3. Select 'Obtain an IP address from a DHCP server'.
4. Click the 'DNS' tab. Delete any DNS addresses are configured.
5. Click 'OK'.
6. Restart your computer if requested to do so.

TCP/IP Settings for Windows 2000

Windows 2000 automatically created a network adapter profile (named 'Local Area Connection' by default) when the adapter was installed. However, the TCP/IP protocol is not installed by default. You must check if this profile has the Internet Protocol (TCP/IP) installed and properly configured. Note that if you have more than one Ethernet adapter installed on your system, you must only change the settings for the adapter used by the Diva LAN ISDN Modem.

Procedure

1. Click 'Start', 'Settings', 'Network and Dial-up Connections', then 'Local Area Connection'. (Note the name of this connection may be different as it can be changed by the user.) The status window for this adapter is displayed.
2. Click 'Properties'. The properties window for this adapter is displayed.
 - If 'Internet Protocol (TCP/IP)' is not listed in the 'Components' list, go to [Installing TCP/IP](#) (below).
 - If 'Internet Protocol (TCP/IP)' is listed in the 'Components' list, then the protocol is already installed. Go to [Verifying TCP/IP Settings](#) (below).

Installing TCP/IP

1. Click the 'Install' button. The 'Select Network Component Type' window appears.
2. Select 'Protocol' and click 'Add'. A list of available protocols appears.
3. Select 'Internet Protocol (TCP/IP)' then click 'OK'. Once the installation is complete, you are returned to the properties window.
4. Do not click the 'Close' button yet; next you will verify your TCP/IP settings. Continue with [Verifying TCP/IP Settings](#) (below).

Verifying TCP/IP Settings

1. Select 'Internet Protocol (TCP/IP)', then click 'Properties'.
2. The settings should be 'Obtain an IP address automatically' and 'Obtain DNS server automatically'.
3. Click 'OK', then 'OK' again, then click 'Close'.
4. Restart your computer if requested to do so.

TCP/IP Settings for Macintosh (Mac OS 8 or later)

TCP/IP is installed by default with your Mac OS. If it is not in the Control Panels folder, reinstall it from your System Installation CD.

Procedure

1. From the Apple menu, select 'Control Panels'.
2. Select 'TCP/IP'.
3. Set 'Connect via' to 'Ethernet'.
4. Set 'Configure' to 'Using DHCP Server'.
5. Close the TCP/IP control panel.
6. Click 'Yes' to save the changes.

It is not necessary to restart your computer after making these changes.

Troubleshooting

Below are some of the most common problems associated with setting up the Diva LAN ISDN Modem.

The front indicator lights may also give insight into what is happening to the device. See [Indicator Lights](#) on page 49 for more information.

General

- Verify all cables. The ISDN, Ethernet, and power cables have corresponding indicator lights for verification.
- If the ISDN light is blinking, verify that the ISDN cable is connected to the correct port. If the ISDN light continues to blink, the Diva LAN ISDN Modem is having difficulty establishing a connection with the ISDN network. Contact your provider for assistance.
- If the Ethernet light is not lit, check that the Ethernet cable is connected properly and that you are using the proper cable type (standard for connecting to a hub, crossover if you are connecting directly to a computer). You can use the crossover adapter with the blue Ethernet cable (both of which are included in your package) if you do not have a crossover cable.
- Press the 'Reset' button once quickly. This will reboot the device and could resolve any problems you are having. See [Resetting the Device](#) on page 50 for more information.

Cannot access the Internet

- Verify that all account information has been entered correctly. If necessary, re-run the Internet Wizard (see [Step 3: Internet Wizard](#) on page 26 for more information).
- Make sure the TCP/IP settings for your computer are configured properly (see [Verifying TCP/IP Settings](#) on page 36), and that you have rebooted your computer.

Cannot access the 'Login' page

- Make sure your Ethernet card is set to get its IP address dynamically. If required, restart your computer so that the new settings take effect. See [Verifying TCP/IP Settings](#) on page 36 for more information, or consult the help included with your operating system.
- Make sure your web browser is configured to use the LAN and not a dial-up connection, and that your browser is not set to use a proxy server. See [Adjusting Browser Settings](#) on page 24 for instructions on how to do this.
- Change the IP address of your computer manually to 192.168.1.2, restart, and try again. This puts your computer on the same subnet as the Diva LAN ISDN Modem. However, this is not the preferred setup method.
- The device IP address is a setting stored on the device and can be changed. Verify that you are using the correct IP address (the default is 192.168.1.1).

Not able to access the 'Login' web page during setup on a LAN

If you are adding the Diva LAN ISDN Modem to a LAN but are not able to contact the device via your web browser, it is recommended you connect the device to a single computer first to change any necessary parameters. Below are some installation tips:

- The device IP address can be changed; verify that you are trying to access the correct IP address if connecting through a browser. Consult your network administrator for more information.

- If your Diva LAN ISDN Modem is connected to a LAN, the device may be working properly but may not be accessible across the LAN. This is because the Diva LAN ISDN Modem needs to be on the same subnet as the computer you are using to access it. For example, if the Diva LAN ISDN Modem is set to 192.168.1.1, your computer should be 192.168.1.###. If this is the case, the best solution is to connect the Diva LAN ISDN Modem directly to a computer (and not over a LAN) and attempt to contact the device. Consult your network administrator for more information.
- Make sure the Diva LAN ISDN Modem has a unique IP address. For example, the default IP address is 192.168.1.1. If another device on the LAN already has this address, you may not be able to contact the Diva LAN ISDN Modem. To verify, ping the device address (192.168.1.1 by default). If you get a reply, disconnect the Diva LAN ISDN Modem from your LAN and ping 192.168.1.1 again. If you still get a reply, you have two devices on the same LAN with the same IP address.

In this case, you have three options: change the IP address of the other device, remove the other device from the LAN, or temporarily connect the Diva LAN ISDN Modem directly to a computer (outside of the LAN).

- If you first tried to set up your Diva LAN ISDN Modem on a LAN that has an existing DHCP server, press the Reset button once on the back of the device. The Diva LAN ISDN Modem may have detected your existing DHCP server and switched off its own DHCP services; pressing Reset turns DHCP back on.
- If you cannot log on as described above, try the following: Change the IP address of the computer to 192.168.1.2, restart if necessary, then open the URL **192.168.1.1** using your web browser.

Fault light is red

- Press the reset button to resolve the problem.
- If the fault light stays red, hold down the Reset button for 15 seconds to reset the device to factory defaults. Note that this procedure will erase all configuration settings. See [Resetting the Device](#) on page 50 for more information.
- If the light stays red, contact your Eicon Networks supplier.

Browser Settings

If you are not able to access the configuration pages, verify your browser settings as described below. Note that the steps may vary slightly depending on the browser version used.

Internet Explorer version 5 or later:

- From the 'Tools' menu, select 'Internet Options', then click the 'Connections' tab. Click 'Setup'.
- Select the option 'I want to set up my Internet connection manually', then click 'Next'.
- Select 'I want to connect through a local area network', then click 'Next'.
- Clear all proxy options, then click 'Next'.
- Clear the option 'Connect to the Internet immediately', then click 'Finish'.
- Click 'OK', then retry accessing the web-based configuration pages.

Internet Explorer previous to version 5

- From the 'View' menu, select 'Internet Options', then click the 'Connection' tab.
- Verify that 'Connect to the internet using a local area network' is enabled.
- Verify that the 'Proxy Server' option is disabled.
- Click 'OK', then retry accessing the web-based configuration pages.

Netscape Navigator

Depending on the version of Navigator, do one of the following.

- Under Options, click 'Network Preferences', then 'Proxies'. Verify that the 'No Proxies' option is selected.
- Under the 'Edit' menu, click 'Preferences', 'Advanced', then 'Proxies'. Verify that the 'Direct Connection to the Internet' is enabled.
- Click 'OK', then retry accessing the web-based configuration pages.

Technical Support

To obtain technical support for Eicon Networks products, visit our web site at:

<http://www.eicon.com/support/>

For customer service, contact your Eicon Networks supplier.

To go directly to the Diva LAN ISDN Modem product page, visit

<http://www.eicon.com/divalan/>

Using your Diva LAN ISDN Modem

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Indicator Lights	49
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General Information

The following describes general topics related to the everyday use of your Diva LAN ISDN Modem.

Dialing Out

The Diva LAN ISDN Modem automatically dials out and establishes the ISDN link to the Internet. You simply launch the applications you use to do your work, such as a web browser or e-mail program, and you are automatically connected.

You can also establish your connections manually, dialing and hanging up as you see fit. See [Dialing Out](#) on page 45 for details.

Idle Timer

By default, the Diva LAN ISDN Modem stays connected until the line has been idle for two minutes. To adjust this setting, see [Idle Timer](#) on page 70.

Registering your Product

Once your setup is running you should visit the Eicon Networks web site and register your Diva LAN ISDN Modem. This ensures that you will always be kept up-to-date of new features and firmware releases. Point your web browser to:

`http://www.eicon.com/divalan/`

then click the button 'Register Online' on the left side of the page.

You can also follow the firmware upgrade procedure in the section [Upgrading Firmware via a Web Browser](#) on page 61. Registration is part of the upgrade process.

Minimizing your ISDN charges

The Diva LAN ISDN Modem has several pre-defined settings to help reduce your ISDN charges. To adjust these settings for your installation, see [Minimizing ISDN Charges](#) on page 63 and [Security](#) on page 111.

Using telephones, fax machines, and modems

See [Phone Settings and Number Assignments](#) on page 85 for complete details on setting up your analog devices. See [Calling Features](#) on page 97 for information on how to use calling features.

Configuring security features

The Diva LAN ISDN Modem provides a wide range of security features. See [Security](#) on page 111 for complete details.

Dialing Out

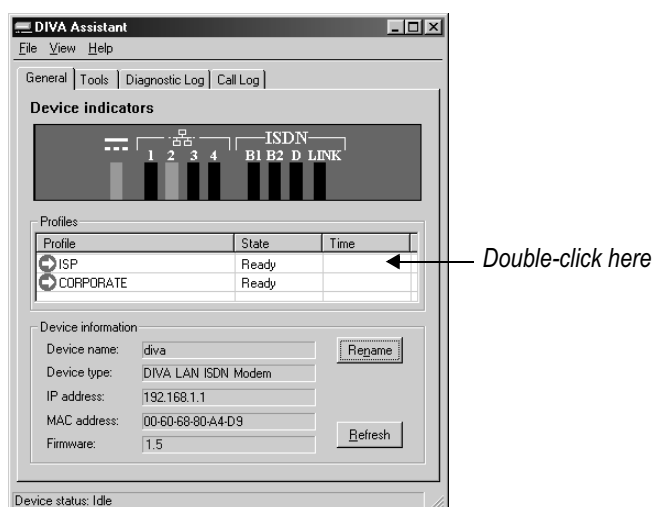
The Diva LAN ISDN Modem automatically dials out and establishes the ISDN link to the Internet as required. You simply launch the applications you use to do your work, such as a web browser or e-mail program, and you are automatically connected.

You can also establish and hang up your connections manually, as described below. If you never want a connection established automatically, you must enable the 'Manual Dialing Only' option for each connection profile (see [Manual Dialing](#) on page 76 for more information).

- [Dialing or Hanging up using the Diva Assistant \(Windows only\)](#)..... 45
- [Dialing or Hanging up using the Web Configuration Pages](#) 46

Dialing or Hanging up using the Diva Assistant (Windows only)

1. Launch the Diva Assistant (you can double-click on the system tray icon).
2. Double-click the profile name (usually 'ISP') you want to dial or disconnect.



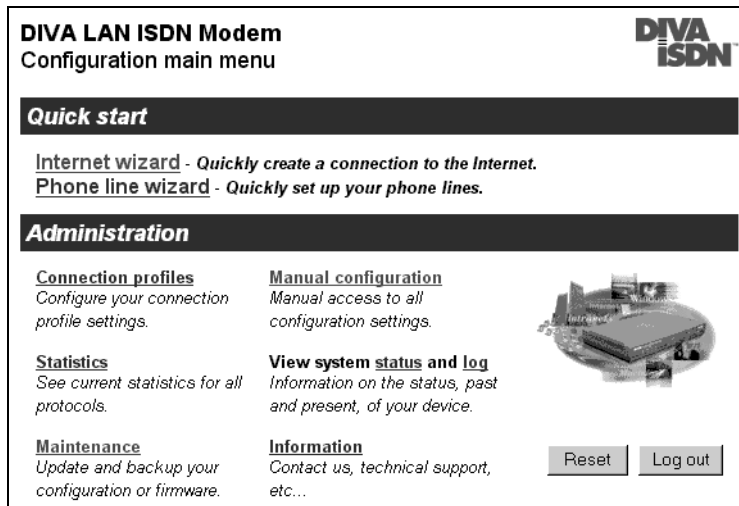
3. The 'Profile Status' dialog box appears.



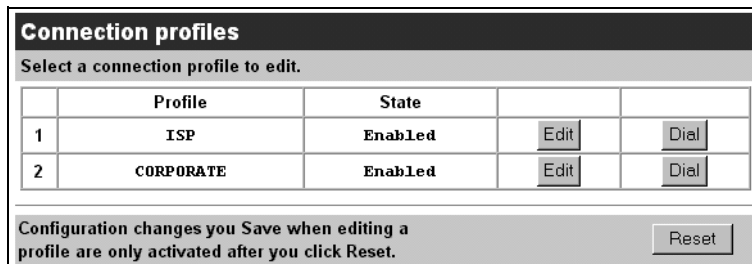
4. If a connection profile is open, you will see the word 'Hang up' on the button at the lower left of the dialog box. If it is not open, you will see 'Dial'. Click this button to disconnect or dial that profile.

Dialing or Hanging up using the Web Configuration Pages

1. Access the configuration pages using your web browser and log in.
 - To do this using the Diva Assistant, launch the Diva Assistant, click the 'Tools' tab, then click the 'Configure' button.
 - To do this manually, launch your web browser and click 'File', 'Open,' type 192.168..1.1 and click 'OK'. (See [Web-based Configuration Interface](#) on page 51 for more information on this topic.)
2. You should see the main menu.



3. Click 'Connection Profiles' (in the menu at left) to see a list of profiles available.



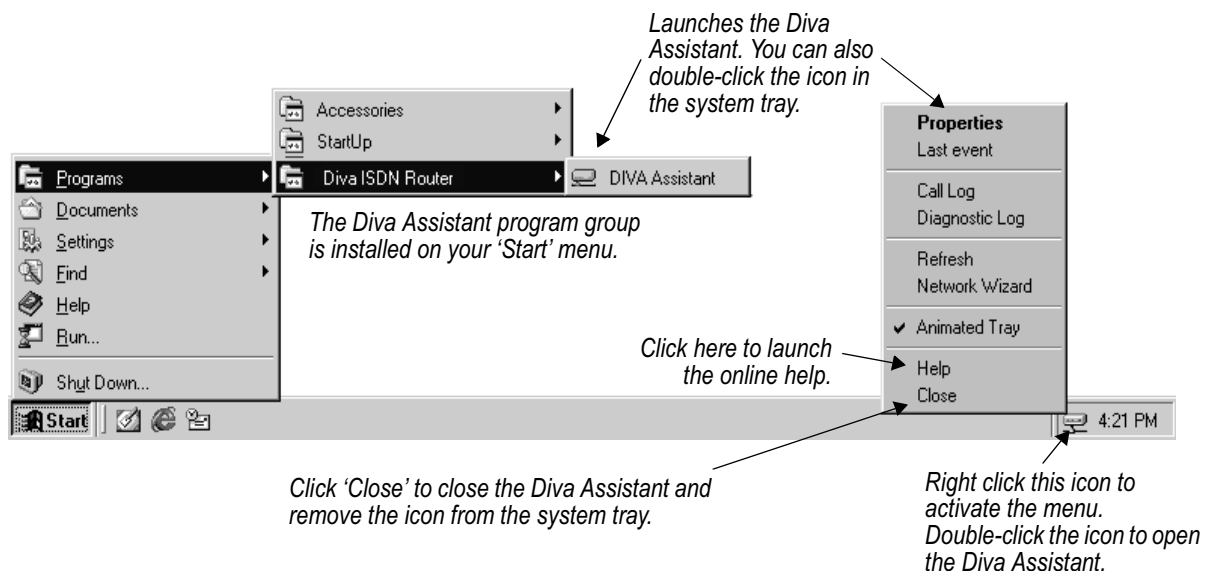
4. If a connection profile is open, you will see the word 'Hang up' on the button at the far right. If it is not open, you will see 'Dial'. Click this button to disconnect or dial that profile.

Diva Assistant (Windows Only)

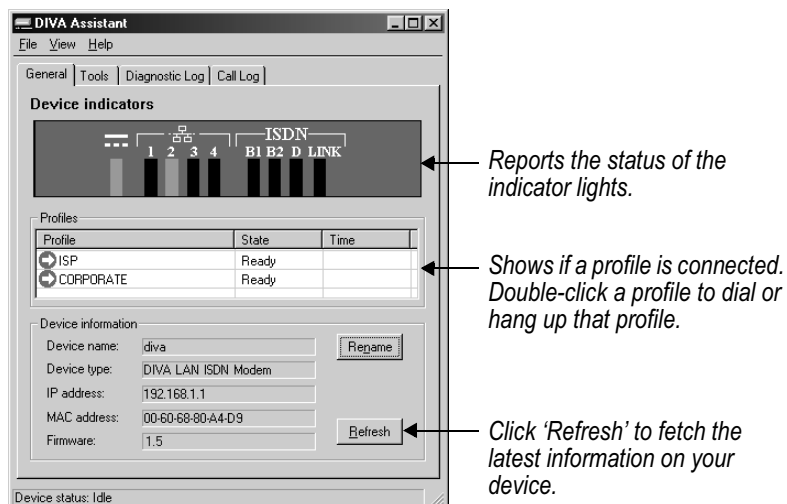
The Windows Diva Assistant provides a convenient way to manage your Diva LAN ISDN Modem. The following is a brief description of how to use the software. For more information, consult the Diva Assistant online help.

Launching the Diva Assistant

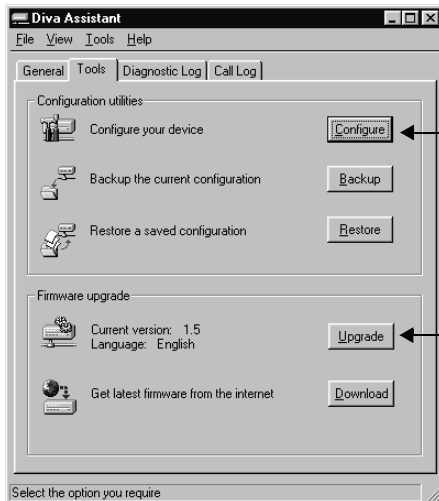
Once you install the Diva Assistant and restart your computer, the Diva Assistant icon will appear in the system tray.



General Tab



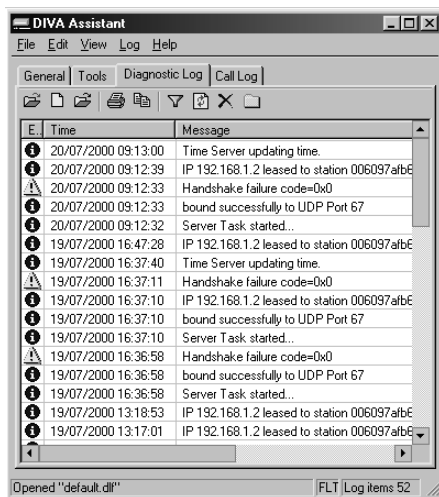
Tools Tab



Starts the web-based configuration interface using your default browser.

Lets you upgrade the device firmware.

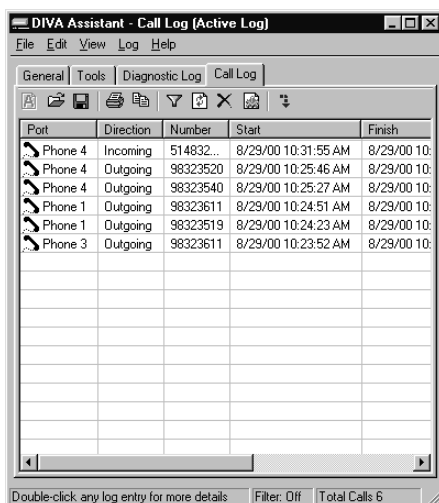
Diagnostic Log Tab



The Diagnostic Log displays the messages sent by the device.

Double-click on an entry to see more details.

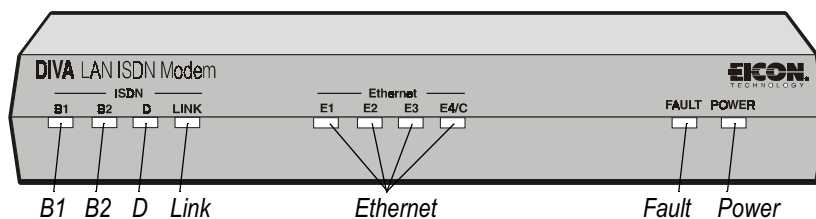
Call Log Tab



The Call Log keeps track of incoming and outgoing calls and the details of each call (number dialed, when started, length of call, etc.)

Indicator Lights

The indicator lights show the status of the phone and Ethernet ports as well as the state of your ISDN line.



Ethernet The Ethernet lights reflect the status of the Ethernet ports. When an Ethernet light is on, an Ethernet-capable device is properly connected. Flashing indicates data is being sent or received via that port.

The fourth light may sometimes blink red to indicate a transmission collision. This is a normal occurrence that will automatically resolve itself.

Power The power light turn on when the power adapter is properly connected.

B1, B2 The B1 and B2 lights reflect the status of the ISDN B-channels. Green indicates a data call. Orange indicates an analog call.

A flashing light means the call is being established. A solid light means a call is connected and the channel is in use.

D The D light reflects the status of the ISDN D-channel. D comes on at the same time as LINK to indicate a properly configured line.

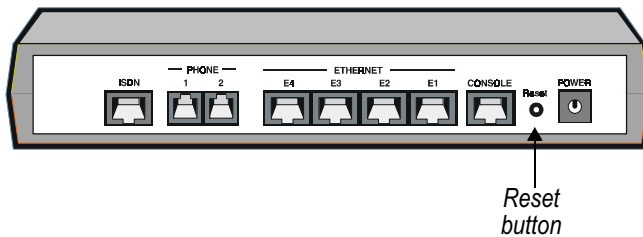
However, when the line is idle, many networks automatically disconnect the D-channel (turning off both D and LINK) to conserve power. Both lights will turn on just before B1 or B2 when a call is made.

Link The Link light reflects the status of the ISDN link. When you first connect the ISDN cable, this light should blink for a few moments then stay solid. If the ISDN cable is removed, this light will flash for a few seconds and then go off. See the D light for more information.

Fault If the Fault light is on, press the Reset button (on the back of the device) to return the device to normal. If the device is not operating properly and the Fault light stays on after pressing Reset, contact your service representative.

Resetting the Device

The location of the Reset button for the Diva LAN ISDN Modem is shown below.



Normal Reset

If you press the Reset button once quickly, you will do a ‘normal’ reset. This reboots the device, and your settings are left intact. You can also reset the device using the web-based configuration interface. You can also reset the device using the web-based configuration interface. See [Web-based Configuration Interface](#) on page 51.

Reset Settings to Factory Defaults

Warning: Reset to factory defaults erases all configuration settings.

To reset to factory defaults, hold down the ‘Reset’ button for about 15 seconds. The B1 and B2 lights will turn red after the first five seconds, then will go off after a total of 15 seconds, indicating the reset is complete.

Note: This procedure will return the default IP address of the Diva LAN ISDN Modem to 192.168.1.1. If you changed the IP address of the Diva LAN ISDN Modem from this default setting, you will need to use the default IP address 192.168.1.1 to access the configuration menu.

You can also reset to factory defaults using the Web-based configuration interface (see [Saving and Resetting Configuration Settings](#) on page 58).

Entering Boot Monitor Mode

If you hold down the reset button for five seconds (until you see the B1 and B2 lights turn red), you will enter Boot Monitor mode. This mode is used for troubleshooting purposes only. Press the ‘Reset’ button once more to return the device back to normal operation.

Web-based Configuration Interface

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Editing LAN Settings.....	57
Saving and Resetting Configuration Settings.....	58
Viewing Status Information	59
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Upgrading Firmware via a Web Browser.....	61

Overview

The Diva LAN ISDN Modem uses a single ISDN link to provide communications services for all your connected devices, managing both data and analog calls.

To accomplish all this, the Diva LAN ISDN Modem implements a number of important ISDN features that enable complex communications requirements to be supported on a single link. When you define your setup with the Internet Wizard, a number of parameters are set to default values that give good results for most cases.

However, due to the number of options that are available, the Internet Wizard cannot fine tune all settings for your particular installation. For optimal performance, or to define a custom setup, you must manually adjust the configuration of the Diva LAN ISDN Modem. These settings are presented as web pages stored on the Diva LAN ISDN Modem and accessed via a web browser.

This chapter explains how to access these web pages and gives step-by-step instructions for some common tasks.

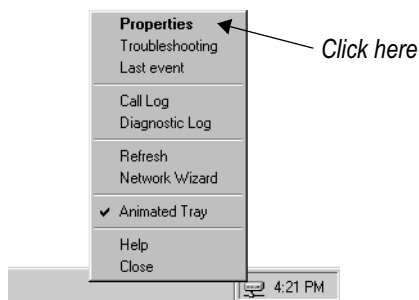
Accessing the Configuration Pages via a Web Browser

The Diva LAN ISDN Modem Configuration Pages allow you to manage the configuration and operation of the Diva LAN ISDN Modem. You can also view status information and perform maintenance tasks like updating the firmware.

Note: Only one user can access the configuration pages at a time.

Procedure

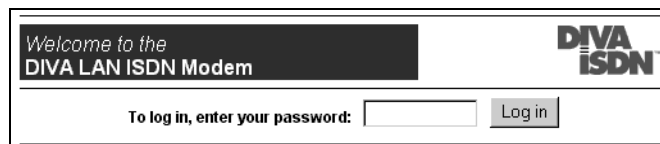
1. If you installed the Diva Assistant software, right-click the Diva LAN ISDN Modem icon in your system tray, then click 'Properties' on the menu. After the Diva Assistant opens, click 'Tools' then 'Configure'.



You can also double-click the system tray icon.

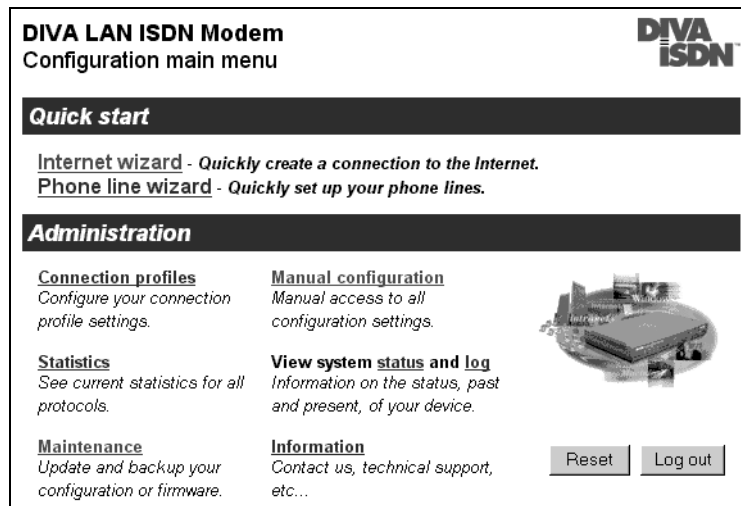
If you did not install the Diva Assistant software, launch your web browser software and click 'File', 'Open', enter 192.168.1.1 and click 'OK'. (If you changed the address of the Diva LAN ISDN Modem, enter the new address instead.)

2. The 'Log In' page appears.



3. Enter the system password, if required, and click 'Log in'. (By default the Diva LAN ISDN Modem has no password.)

4. The main configuration menu appears.



Note: If you have not yet completed the Internet Wizard, most links will not be available.

Making Changes and Getting Help

Parameters are grouped into submenus. Most parameters are accessed through the 'Manual Configuration' link on the main page. For more information, see [General Settings vs. Profile Settings](#) on page 55.

Online help is available for all settings by clicking on a setting name. On some pages, you can get general information about a page by clicking the question mark in the title bar.

Saving configuration settings

Most pages in the configuration interface have a 'Save' button. When you click this button, your changes are saved to the Diva LAN ISDN Modem. However, for the changes to take effect, you must reset the Diva LAN ISDN Modem. You can do this by clicking the 'Reset' button on the main menu.

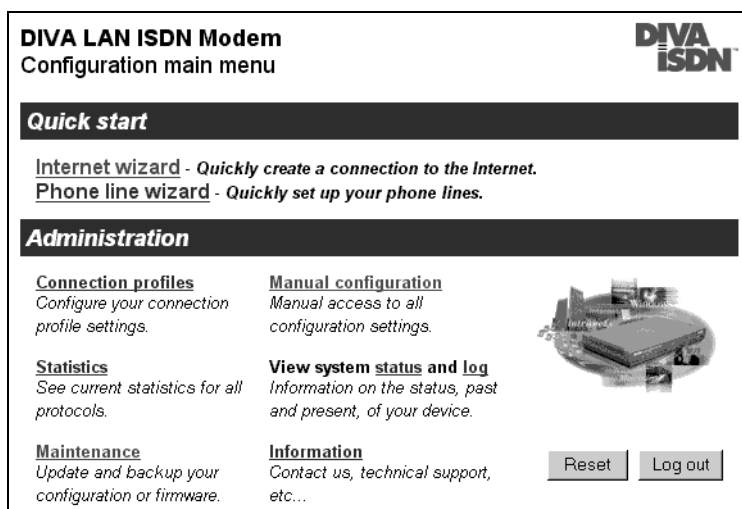
General Settings vs. Profile Settings

Configuration settings are split into two groups: general settings and connection profile settings.

General settings	General settings apply to the Diva LAN ISDN Modem as a whole, and cover settings such as system time, password, phone ports settings, etc.
Connection profile settings	A connection profile is a group of configuration settings that define the characteristics of a connection. Each profile has a number of settings that you can customize. The Diva LAN ISDN Modem supports two profiles: 'ISP' and 'Corporate'. The ISP profile is defines the settings for a connection to the Internet. The Corporate profile is provided so you can define the settings for a direct connection to a remote corporate network. Both can be active at the same time, allowing you to handle different types of connections.

Editing the ISP profile

1. Access the configuration pages using your web browser and log in. You should be at the main menu.



DIVA LAN ISDN Modem
Configuration main menu

Quick start

[Internet wizard](#) - Quickly create a connection to the Internet.
[Phone line wizard](#) - Quickly set up your phone lines.

Administration

[Connection profiles](#)
Configure your connection profile settings.

[Manual configuration](#)
Manual access to all configuration settings.

[Statistics](#)
See current statistics for all protocols.

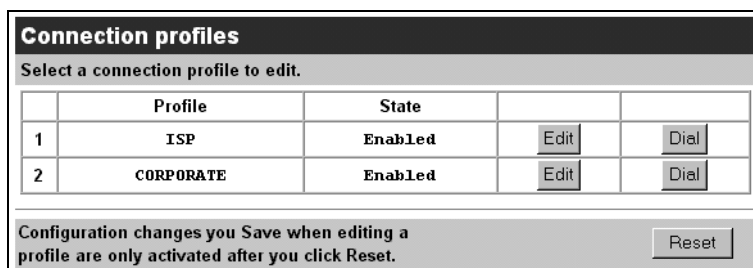
[View system status and log](#)
Information on the status, past and present, of your device.

[Maintenance](#)
Update and backup your configuration or firmware.

[Information](#)
Contact us, technical support, etc...

Reset Log out

2. Click 'Connection Profiles' to see a list of profiles available.



Connection profiles

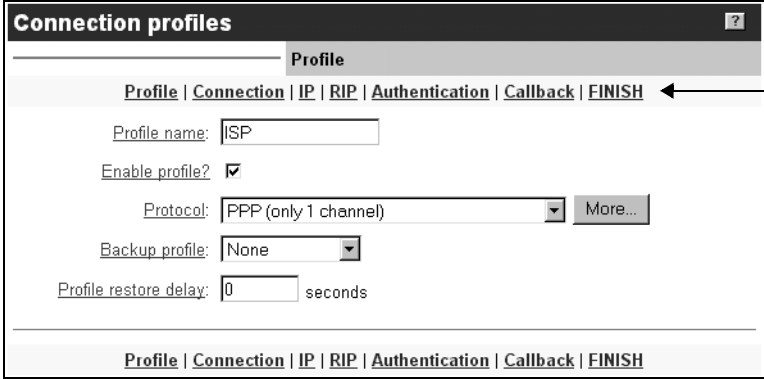
Select a connection profile to edit.

	Profile	State		
1	ISP	Enabled	Edit	Dial
2	CORPORATE	Enabled	Edit	Dial

Configuration changes you Save when editing a profile are only activated after you click Reset.

Reset

3. Click the 'Edit' button next to the ISP profile to display the settings particular to this profile.
Use the menu bar to navigate between the configuration pages: 'Profile', 'Connection', 'IP', 'RIP', 'Authentication' and 'Callback'. For a description of each parameter, click the parameter name to display a help window.



The screenshot shows a web-based configuration interface titled "Connection profiles". At the top, there is a menu bar with tabs: "Profile", "Connection", "IP", "RIP", "Authentication", "Callback", and "FINISH". The "Profile" tab is currently selected. Below the menu bar, the configuration fields for the "Profile" tab are visible: "Profile name" (text box with "ISP"), "Enable profile?" (checkbox checked), "Protocol" (dropdown menu showing "PPP (only 1 channel)" with a "More..." button), "Backup profile" (dropdown menu showing "None"), and "Profile restore delay" (text box with "0" followed by "seconds"). An arrow points from the text "Menu bar" to the menu bar tabs.

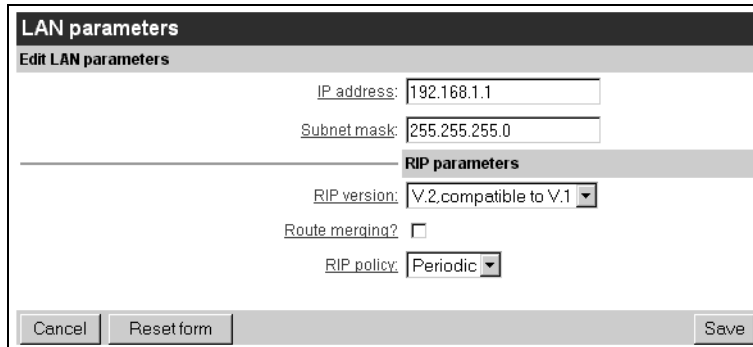
4. When you are done changing settings, click 'Finish', then click 'Save'.
5. To activate the settings you must reset the Diva LAN ISDN Modem. To do this, click the 'Reset' button on the 'Connection Profiles' list page.

Editing LAN Settings

The LAN parameters page defines the settings for the LAN created by the Ethernet hub built into the Diva LAN ISDN Modem. You may need to modify these settings if you need to assign a specific (static) IP address to the Diva LAN ISDN Modem. This is usually the case when installing on an existing LAN. See [LAN Setup](#) on page 31 for more information.

Editing the LAN settings

1. From the main menu, click 'Manual Configuration', then click 'LAN'. The 'LAN Parameters' page appears.



The screenshot shows a web-based configuration window titled "LAN parameters". Below the title bar is a sub-header "Edit LAN parameters". The form contains two main sections. The first section, "LAN parameters", includes input fields for "IP address" (containing "192.168.1.1") and "Subnet mask" (containing "255.255.255.0"). The second section, "RIP parameters", includes a dropdown for "RIP version" (set to "V.2,compatible to V.1"), a checkbox for "Route merging?" (unchecked), and a dropdown for "RIP policy" (set to "Periodic"). At the bottom of the window are three buttons: "Cancel", "Reset form", and "Save".

2. Make your configuration changes. For a description of each parameter, click the parameter name to display a help window.
3. Click 'Save', then 'Reset'.

Saving and Resetting Configuration Settings

The web-based configuration interface makes it easy to save and restore configuration settings on the Diva LAN ISDN Modem. This is useful for backup purposes, or if you intend to maintain several different configurations. You can also reset all settings to factory defaults.

When you save the configuration settings, they are stored in a file on your computer.

Procedure

1. From the main menu, click 'Maintenance'. The maintenance menu appears with two options, 'Firmware' and 'Configuration'.

Menu	
Firmware <i>Backup and/or upgrade firmware</i>	Configuration <i>Backup and/or restore config file</i>

2. Click 'Configuration' to display the 'Configuration Maintenance' page.

The screenshot shows the 'Configuration maintenance' page. At the top, there are navigation tabs: 'Main Menu', 'Manual Config', 'Profiles', 'Maintenance' (which is selected), and 'Statistics'. Below the tabs, the page title is 'Configuration maintenance'. There are three main sections: 1. 'Backup current configuration' with a description 'Save an image of the current configuration to a file on your computer' and a 'Backup' button. 2. 'Restore saved configuration' with a description 'Restore a previously saved configuration from your computer. It is recommended that you *backup* your current configuration *before* you replace it.' and buttons for 'Browse...' and 'Restore'. 3. 'Reset to factory default' with a description 'Resetting to factory defaults will erase all your configuration settings.' and a 'Reset factory settings' button. At the bottom left, there is a 'Back to menu' button.

3. Click 'Backup' to save your configuration settings to a file on your computer.

To restore a previously-saved configuration, click 'Browse' to select the file, then click 'Restore'.

To reset the Diva LAN ISDN Modem to factory default settings, click 'Reset factory settings'. Resetting the Diva LAN ISDN Modem to factory defaults will erase all your configuration settings, including the system password. Consider backing up your current configuration before you reset to factory defaults, just in case.

Note: If you changed the LAN IP address of the Diva LAN ISDN Modem from its default setting of 192.168.1.1, you will lose contact with the web configuration interface after the reset is complete. This is because the reset will return the Diva LAN ISDN Modem to its default of 192.168.1.1. To regain access to the, Diva LAN ISDN Modem open the URL **http://192.168.1.1**.

Viewing Status Information

Click 'Status' from the main menu to view real-time status information.

The screenshot shows a 'System status' window with the following content:

Profile	Status
ISP	Ready
CORPORATE	Ready

ISDN

Line 1 is: L1 Down	Line 2 is: L1 Down
--------------------	--------------------

B1

B2

D

LNK

(automatically refreshed every 10 seconds)

Refresh now

Close

Click the 'Refresh Now' button to update the window.

To find out more about each status field, click on the field name to bring up the online help.

Obtaining Statistics

The Diva LAN ISDN Modem records a variety of statistics, which you can use for information and troubleshooting purposes. Click 'Statistics' from the main menu, then choose the type of statistics you want to view from the menu bar at the top of the page.

For example, the following screen shows ISDN statistics.

Statistics					
ISDN	PPP	Current call	System	Profiles	NetAPI
Ethernet	IP	Last call	ICMP	DHCP	
ISDN Statistics					
=====					
Chan 1: Rx char:	491	Tx char:	751	Errors:	0
Chan 2: Rx char:	0	Tx char:	0	Errors:	0
Refresh Now		Automatic Refresh			

Click the 'Automatic Refresh' button to have the page updated every four seconds. Otherwise, click the 'Refresh Now' button to update the statistics when required.

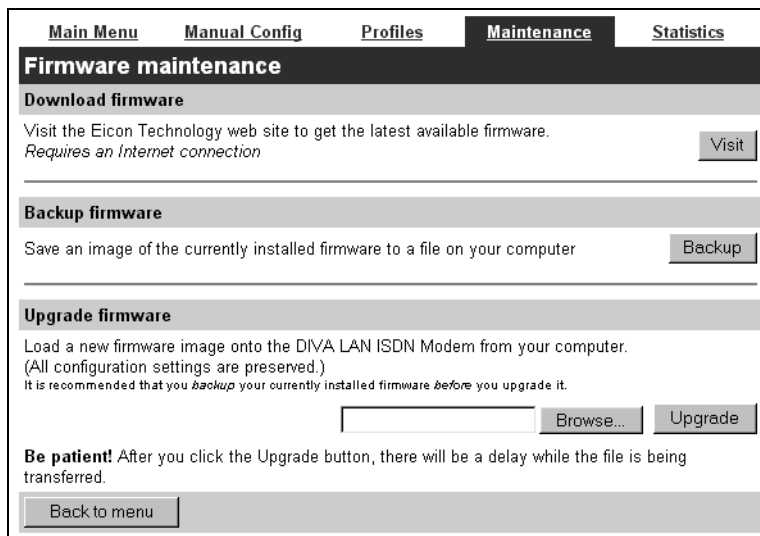
Upgrading Firmware via a Web Browser

Eicon Networks posts the latest Diva LAN ISDN Modem firmware on its web site. You can automatically update your Diva LAN ISDN Modem to the latest version using the web configuration interface.

Note: You can also upgrade firmware with the Diva Assistant for Windows software. See [Tools Tab](#) on page 48 for more information.

Accessing the Firmware Page

1. From the main menu, click 'Maintenance' then 'Firmware'.
2. The 'Firmware Maintenance' page appears.



The screenshot shows a web interface with a top navigation bar containing links: Main Menu, Manual Config, Profiles, Maintenance (highlighted), and Statistics. Below the navigation bar is a section titled 'Firmware maintenance'. It contains three main sections: 'Download firmware' with a 'Visit' button, 'Backup firmware' with a 'Backup' button, and 'Upgrade firmware' with a 'Browse...' button and an 'Upgrade' button. A 'Back to menu' button is at the bottom left. The 'Upgrade firmware' section includes instructions to load a new firmware image and a warning to backup current firmware before upgrading.

Backing up the current firmware

If you wish, you can save a copy of the Diva LAN ISDN Modem's current firmware to disk.

1. Click the 'Backup' button.
2. When prompted, save the file to a location on your hard disk.

Retrieving a new firmware

If you haven't already done so, you can retrieve a new firmware file from the Eicon Networks web site. This requires a working Internet connection. If you have acquired firmware from another method, or wish to use the firmware located on the Diva CD-ROM, skip this step.

1. Click the 'Visit' button. This points your web browser to the Diva LAN ISDN Modem firmware upgrade page on the Eicon Networks web site.
2. Select the latest firmware release from this site and download it to your computer.
3. If required, unzip the downloaded file.
4. Click the 'Back' button at the top of the page (not your browser's 'Back' button) to return to the 'Firmware Maintenance' page.

Upgrading your firmware

1. Click the 'Browse' button.
2. From within the 'Open' dialog box, double-click on the new firmware file.

3. Click the 'Upgrade' button to begin the upgrade process.
4. When complete, the Diva LAN ISDN Modem is automatically reset to activate the new firmware.

Note: *Do not reset the Diva LAN ISDN Modem or disconnect the power adapter during this process.*

Minimizing ISDN Charges

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Manual Dialing	76
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Data over Voice	78
Traffic Filtering	79

Overview

ISDN billing practices vary depending on your telephone company. You could be charged:

- a flat rate each month
- per call
- per minute

To help you reduce your ISDN charges, the Diva LAN ISDN Modem provides several cost-cutting configuration options. Use this chapter to find the best options for use on your ISDN line.

Selecting a Connection Protocol

When you completed the Internet Wizard in [Setup](#) on page 15, the Diva LAN ISDN Modem used several default settings that work well for most situations. One of these settings was the choice for connection protocol, which governs the rules by which ISDN channels are enabled and disabled. If you are charged for every time you open an ISDN channel as well as a per-minute fee, it can be important to specify what type of connection protocol will benefit your situation the most.

- Before making any decisions or changes to the ISP connection protocol setting, read the section [Important ISDN Concepts](#) on page 65.
- The actual connection protocols are described in [Available Connection Protocols](#) on page 65.
- When you are ready to edit the ISP connection protocol setting, see [Changing the Default Connection Protocol Setting](#) on page 67.

Important ISDN Concepts

This section describes important ISDN concepts. Understanding these concepts will help you decide how to adjust the settings of your Diva LAN ISDN Modem for optimal performance and cost savings.

ISDN channels	ISDN lines are defined in terms of <i>channels</i>, with each channel supporting a specific type of communication. The Diva LAN ISDN Modem supports two ISDN channel types: D-channel: The Device channel is used to control the setup of ISDN connections on the B channels, but they can also be used to transmit packet data traffic. The D-channel has a transmission speed of 16 kbps. B-channel: Bearer channels are used to carry data or voice traffic and have a transmission speed of 56 or 64 kbps.
ISDN access interfaces	An access interface is the physical connection between you and an ISDN network. It defines the number of D- and B-channels that are available to you and the total transmission speed of the connection. The Diva LAN ISDN Modem supports a single Basic Rate Interface (BRI), which is comprised of one D-channel (16 kbps) and two B-channels (64 kbps) for a total user bit rate of 144 kbps.
ISDN channel usage	All connections, both data and voice, are carried on the B-channels. The Diva LAN ISDN Modem dynamically assigns B-channels on demand. Therefore, there is no guarantee which B-channel a specific connection will receive. The same is true for your ISDN phone numbers. Your first phone number does not necessarily map to ISDN channel B1. Also note that each type of connection requires one B-channel to operate. For example, if both phone ports are in use, then both B-channels are in use, and you would not be able to open an Internet connection (a data call).

Available Connection Protocols

Since the Diva LAN ISDN Modem supports so many potential connections, a set of rules is needed to control how the two ISDN B-channels are shared between connections. These rules are based on the type of connection protocol you decide to use for your data traffic.

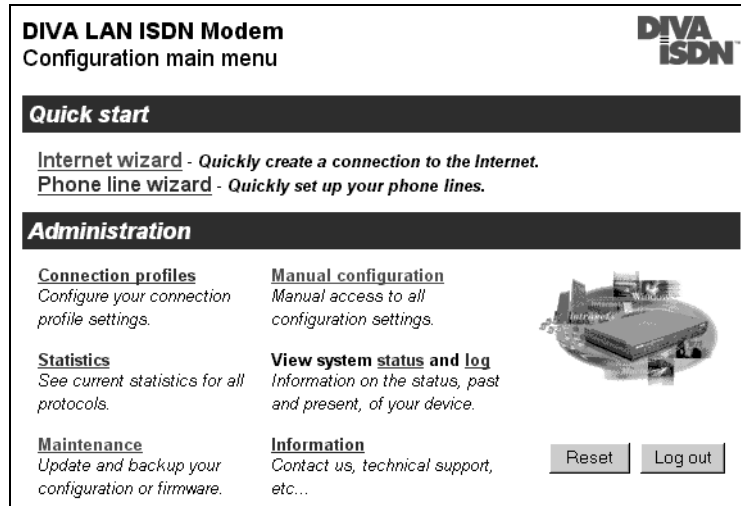
The Diva LAN ISDN Modem supports the protocols PPP (a widely-used standard for transferring data on point-to-point links) and V.120. Additionally, PPP is supported in various ways, and each version has its own specific features. These protocols are described in more detail below.

PPP	PPP operates on a single ISDN B-channel. Since two B-channels are available, the Diva LAN ISDN Modem can support two PPP connections at the same time. This is useful if you need to maintain a connection to the Internet and to a remote corporate network, or if you intend to support incoming data calls.
Multilink PPP	With Multilink PPP (MLPPP), the Diva LAN ISDN Modem combines both ISDN B-channels into a single 128 kbps PPP communications link. Both B-channels remain in use as long as the connection is active, which may result in excessive ISDN connection charges if the link is frequently idle. MLPPP reserves both B-channels for its exclusive use. If you set your ISP profile (Internet connection) to MLPPP, you will not be able to make or receive other data calls, as both B-channels will be tied up.
Multilink PPP+BACP	MultiLink PPP+BACP works in a similar way to MLPPP, as both B-channels are combined into a single 128 kbps link. However, the Diva LAN ISDN Modem uses BACP (Bandwidth Allocation Control Protocol) to open or close the second ISDN B-channel as the traffic volume warrants. This reduces your communications charges by ensuring that two ISDN channels are never active when one is sufficient. As with MLPPP, MLPPP+BACP reserves both B-channels for its exclusive use. If your Internet connection uses MLPPP+BACP, you will not be able to make or receive other data calls.
Multilink PPP+AODI (Always On / Dynamic ISDN)	Always On / Dynamic ISDN uses the ISDN D-channel to maintain a permanent connection to your ISP or corporate network. This connection operates at 9.6 kbps using the X.25 protocol and can be used to send and receive low-bandwidth data, such as e-mail or web-based push content. Not all ISDN providers support this feature. Check with your ISDN provider before using this protocol. AO/DI incorporates BACP to monitor incoming and outgoing traffic. When traffic volume warrants, it enables one or two B-channels to meet the demand. MLPPP + AO/DI can also drop both B-channels when idle. When bandwidth demand increases, one or both B-channels will be brought back up. Note, however, that the speed of the D-channel (9.6 kbps) is much slower than a B-channel (64 kbps). As with MLPPP, MLPPP + AO/DI reserves both B-channels for its exclusive use. If your Internet connection uses MLPPP + AO/DI, you will not be able to make or receive other data calls. To configure AO/DI settings, see Configuring AO/DI on page 80.
The V.120 Protocol	V.120 was designed to allow non-ISDN devices to communicate with the ISDN network. The Diva LAN ISDN Modem provides support for V.120, so you can connect with such legacy systems. For example, in many countries around the world, Compuserve offers access to their network over ISDN, using the V.120 protocol.

Changing the Default Connection Protocol Setting

The following procedure describes how to change the default connection protocol setting for the existing ISP profile. Before editing this setting, you should already have followed the Internet Wizard as described in [Setup](#) on page 15.

1. Access the configuration pages using your web browser and log in. You should be at the main menu.



DIVA LAN ISDN Modem
Configuration main menu

Quick start

[Internet wizard](#) - Quickly create a connection to the Internet.
[Phone line wizard](#) - Quickly set up your phone lines.

Administration

[Connection profiles](#)
Configure your connection profile settings.

[Manual configuration](#)
Manual access to all configuration settings.

[Statistics](#)
See current statistics for all protocols.

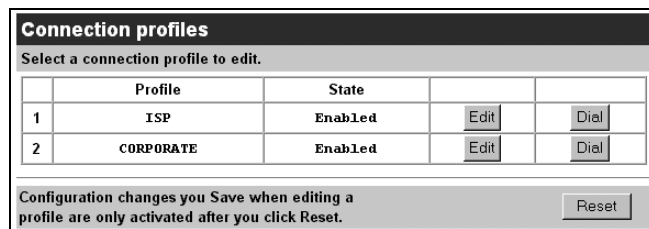
[View system status and log](#)
Information on the status, past and present, of your device.

[Maintenance](#)
Update and backup your configuration or firmware.

[Information](#)
Contact us, technical support, etc...

Reset Log out

2. Click 'Connection Profiles'. The list of available profiles appears.



Connection profiles

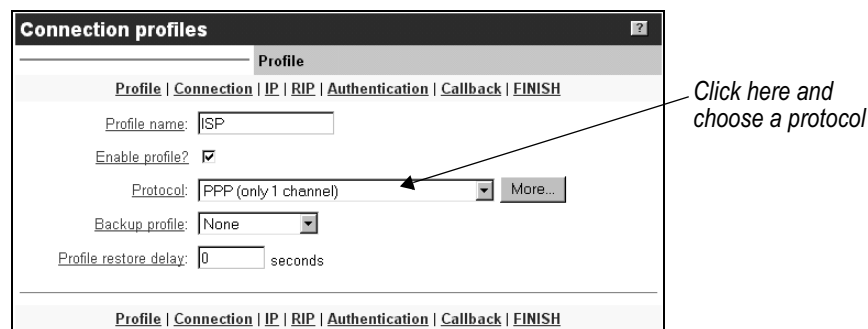
Select a connection profile to edit.

	Profile	State		
1	ISP	Enabled	Edit	Dial
2	CORPORATE	Enabled	Edit	Dial

Configuration changes you Save when editing a profile are only activated after you click Reset.

Reset

3. Click 'Edit' for the ISP profile. The profile page for the ISP profile appears.
4. Select a protocol from the 'Protocol' drop down menu.



Connection profiles

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Profile name: ISP

Enable profile? ☒

Protocol: PPP (only 1 channel) More...

Backup profile: None

Profile restore delay: 0 seconds

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Click here and choose a protocol

5. Click 'Finish', then 'Save', then 'Reset'.

Cost Control

The Diva LAN ISDN Modem groups the most commonly used options for reducing your ISDN charges on the Cost Control page. To define cost control settings, click 'Manual Configuration' from the main menu, then 'Cost Control'. The 'Cost Control' page appears.

Cost Control

Idle timer links

Go and adjust the idle timer for profile ISP or profile CORPORATE.

Data call thresholds

Enable data call threshold monitoring? ☒

Threshold monitoring interval: 1 Days

Maximum number of calls: 50

Maximum duration of calls: 4 Hours

ISDN billing intervals

Initial billing interval: 60 seconds

Recurring billing interval: 60 seconds

Cancel Reset form Save

Idle Timer Link (First Row)

The 'Idle Timer' setting is part of cost control, but can be set for each individual profile and is configured on separate web pages. See [Idle Timer](#) on page 70 for more information.

Data Call Thresholds

By defining data call thresholds, you are able to limit the total number of calls or total length of calls made by any one profile during a set period of time. This is especially useful as a safety measure if you have devices that may inadvertently generate a large number of calls or may stay connected indefinitely.

The threshold monitoring interval is set in days. During this interval, the Diva LAN ISDN Modem tracks the duration and number of calls each profile makes. You can set two different limits:

- 'Maximum duration of calls': Sets the maximum number of hours a profile can be connected during the threshold monitoring interval. Range: 0 (disabled), 1 to (24 * number of days in the interval).
- 'Maximum number of calls': Set the maximum number of calls a profile can make during the threshold monitoring interval. Range: 0 (disabled) to 1000.

If a profile exceeds either limit, all profiles are disabled. To re-activate the profiles, you must reset the Diva LAN ISDN Modem or dial the profiles manually. Either way, the threshold interval is reset. To determine if a profile has been disabled, click 'Connection Profiles' from the main menu.

ISDN billing intervals

A billing interval is the minimum amount of connection time your ISDN provider recognizes. For example, many ISDN providers use a one minute interval, which means you pay the same amount whether you are connected for ten seconds, or sixty seconds. Sometimes, two intervals are used, one for the first minute, and one for each subsequent minute.

It is to your advantage to stay connected for the entire length of your billing interval. This helps avoid situations where a connection is established to transmit or receive a small amount of data, taken down, then immediately brought up again moments later.

The Diva LAN ISDN Modem has two timers that let you manage your billing intervals.

- **Initial Billing Interval:** Sets the minimum amount of time that an ISDN B-channel will be enabled.
- **Recurring Billing Interval:** Sets the minimum amount of time that an ISDN B-channel remains enabled after the Initial Billing Interval expires.

These timers should be set to match the billing intervals used by your ISDN provider. For example, if your ISDN provider charges a flat fee for the first minute, and then bills every 40 seconds thereafter, you would set the intervals as follows.

- Initial Billing Interval = 60 seconds
- Recurring Billing Interval = 40 seconds

This ensures that each time an ISDN B-channel is enabled, it stays active for at least 60 seconds. This avoids a situation where a B-channel is enabled only for 30 seconds, dropped, then enabled again a few seconds later. If a B-channel is up for more than 60 seconds, then the interval is reduced to 40 seconds.

The billing interval timers work in conjunction with the idle timer. When the idle timer expires, the B-channel is dropped at the end of the next billing interval.

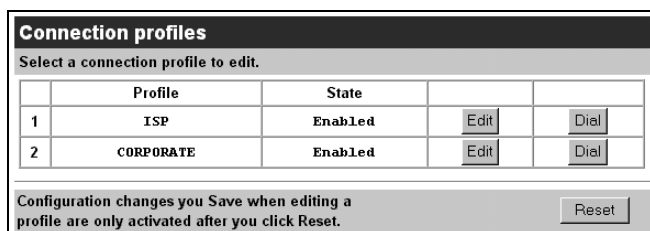
Idle Timer

Each profile has its own idle timer. The idle timer controls how long a data call stays connected when no traffic is being sent or received. When the idle timer expires, the Diva LAN ISDN Modem disconnects the call at the end of the next billing interval.

If you set the idle timer to 0, the call will never be disconnected, and you will have to disconnect the call manually.

Setting the Idle Timer

1. From the main menu, click 'Manual Configuration', then 'Connection Profiles'. The 'Cost Control' page appears.
2. Click 'Edit' for the profile you want to change.

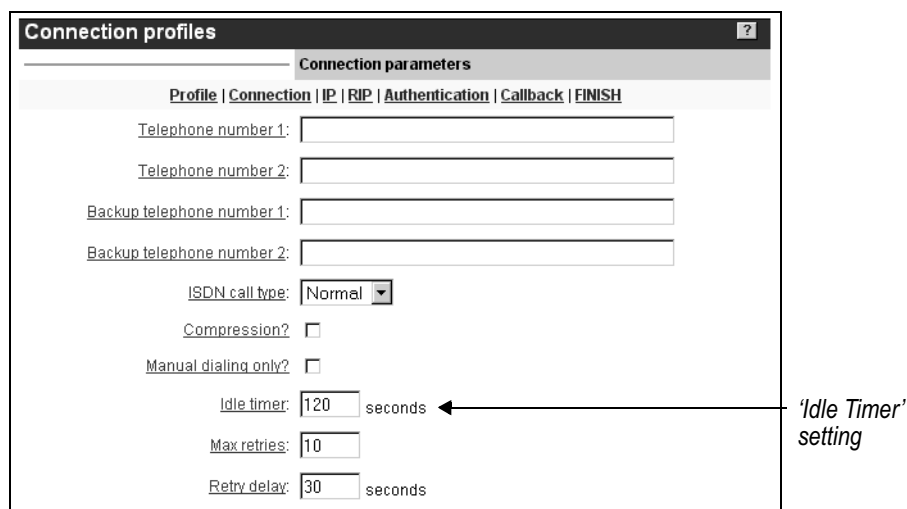


	Profile	State		
1	ISP	Enabled	Edit	Dial
2	CORPORATE	Enabled	Edit	Dial

Configuration changes you Save when editing a profile are only activated after you click Reset.

Reset

3. Click the 'Connection' link. The Diva LAN ISDN Modem displays the 'Connection Parameters' page for that profile, where you can set the Idle Timer.



Connection profiles

Connection parameters

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Telephone number 1:

Telephone number 2:

Backup telephone number 1:

Backup telephone number 2:

ISDN call type: Normal

Compression? ☐

Manual dialing only? ☐

Idle timer: 120 seconds

Max retries: 10

Retry delay: 30 seconds

'Idle Timer' setting

4. Enter a new value in the 'Idle Timer' field.
5. Click 'Finish', then 'Save', then 'Reset'.

Bandwidth Allocation Control Protocol (BACP)

The Bandwidth Allocation Control Protocol (BACP) works in conjunction with the MLPPP connection protocol to regulate usage of your ISDN line. The Diva LAN ISDN Modem uses BACP to monitor incoming and outgoing traffic, and to open or close the second ISDN B-channel as the traffic volume warrants. This reduces your communications charges by ensuring that two ISDN channels are never active when one is sufficient.

You customize how BACP opens and closes B-channels by setting the following parameters.

- ‘Delay for opening the 2nd B-channel’: Sets the amount of time data traffic on the first ISDN B-channel must exceed the specified Threshold value, for BACP to bring up the second B-channel.
- ‘Threshold for opening the 2nd B-channel’: Sets the percentage of total bandwidth on the first B-channel that must be exceeded.
- ‘Delay for closing the 2nd B-channel’: Sets the amount of time data traffic on the first ISDN B-channel must be below the specified Threshold value, for BACP to drop the second B-channel.
- ‘Threshold for closing the 2nd B-channel’: Sets the percentage of total bandwidth on the first B-channel that traffic must be below, for BACP to drop the second B-channel.

Example

Assume the parameters are set as follows:

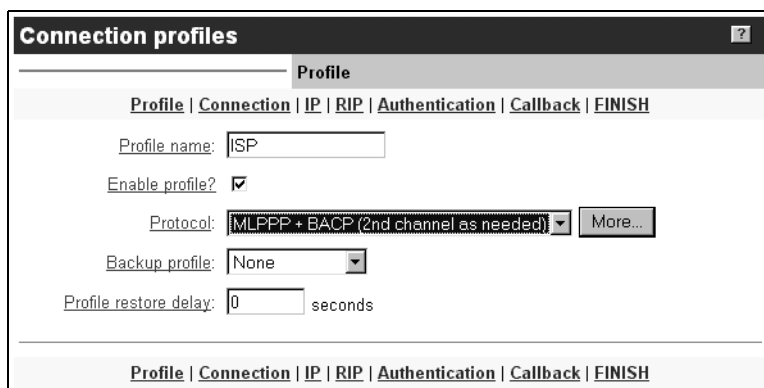
- Delay for opening the 2nd B-channel: 5
- Threshold for opening the 2nd B-channel: 50
- Delay for closing the 2nd B-channel: 5
- Threshold for closing the 2nd B-channel: 40

When traffic on the first B-channel exceeds 32 kbps (50% of 64 kbps) for five seconds, BACP enables the second B-channel. The second B-channel remains active until traffic on the first B-channel falls below 25.6 kbps (40% of 64 kbps).

Configuring BACP

Each profile that uses BACP has its own BACP settings. To configure BACP for a profile, do the following:

1. From the web configuration menu, click ‘Connection Profiles’.
2. Click the ‘Edit’ button next to the ‘ISP’ profile. The ‘Profile’ page appears.



The screenshot shows a web interface titled 'Connection profiles' with a sub-tab 'Profile'. The interface includes a navigation bar with links: Profile, Connection, IP, RIP, Authentication, Callback, and FINISH. The main content area contains the following fields and controls:

- Profile name:** A text input field containing 'ISP'.
- Enable profile?:** A checkbox that is checked.
- Protocol:** A dropdown menu showing 'MLPPP + BACP (2nd channel as needed)' with a 'More...' button next to it.
- Backup profile:** A dropdown menu showing 'None'.
- Profile restore delay:** A text input field containing '0' followed by the unit 'seconds'.

At the bottom, there is another navigation bar with links: Profile, Connection, IP, RIP, Authentication, Callback, and FINISH.

3. Change the protocol setting to 'MLPPP+BACP' if required.

Connection profiles

Profile

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Profile name: ISP

Enable profile? ☒

Protocol: MLPPP + BACP (2nd channel as needed) More...

Backup profile: None

Profile restore delay: 0 seconds

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

This should be
'MLPPP+BACP'

4. Click the 'More' button next to the Protocol field. You will see the 'BACP Parameters' page.

Connection profiles : BACP parameters

Delay for opening the 2nd B-channel: 5 seconds

Threshold for opening the 2nd B-channel: 70 %

Delay for closing the 2nd B-channel: 5 seconds

Threshold for closing the 2nd B-channel: 40 %

Cancel Reset form Save

5. Set the BACP parameters as required.
6. Click 'Save', then 'Reset'.

ISDN Active Intervals

ISDN active intervals are used to place restrictions on when data calls or analog calls can be made or received.

Setting ISDN Active Intervals

1. From the main menu, click 'Manual Configuration', then click 'ISDN active intervals'.

Rule	Day	Time (starting & ending)
1	- Not Used -	00:00 - 00:00
2	- Not Used -	00:00 - 00:00
3	- Not Used -	00:00 - 00:00
4	- Not Used -	00:00 - 00:00
5	- Not Used -	00:00 - 00:00
6	- Not Used -	00:00 - 00:00
7	- Not Used -	00:00 - 00:00
8	- Not Used -	00:00 - 00:00
9	- Not Used -	00:00 - 00:00
10	- Not Used -	00:00 - 00:00

2. Select the checkbox next to 'Enable ISDN active intervals'.
3. For each interval, specify the day of the week to which it applies as well as the starting and ending times. Make sure you set the system clock (click 'Manual Configuration', then 'System'), so the time and date on the Diva LAN ISDN Modem are accurate.
4. Click 'Save' then 'Reset'.

Spoofing NetBIOS services

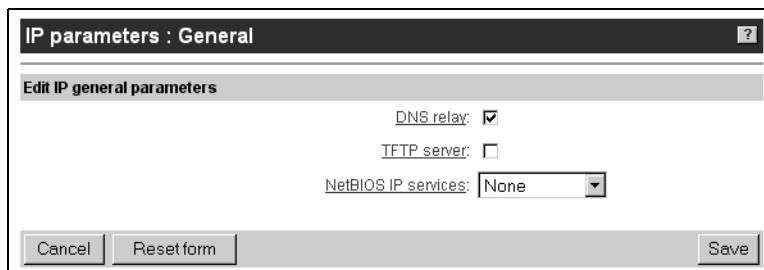
The NetBIOS protocol is used by Windows 95/98/NT to support Microsoft Windows Network Neighborhood, the MAP NETWORK option in Windows Explorer, and various DOS-based networking commands (such as net use, net view, and net logon). To maintain these services, NetBIOS regularly exchanges bookkeeping messages between connected systems. This can cause increased ISDN charges as the line is brought up just to transfer these messages.

The Diva LAN ISDN Modem provides several options that let you choose the level of NetBIOS support you want to maintain.

- **All:** The Diva LAN ISDN Modem forwards all NetBIOS traffic to the remote site. No cost savings is achieved.
- **Intelligent:** The Diva LAN ISDN Modem spoofs (replies to without forwarding) all unnecessary traffic NetBIOS messages to reduce usage of the ISDN line. This option provides full support for all Network Neighborhood functions.
- **Minimal:** The Diva LAN ISDN Modem reduces NetBIOS traffic to a minimum. This options does not support Network Neighborhood functions. However, it does provide support for the MAP NETWORK option in Windows Explorer and DOS-based networking commands such as net use, net view, and net logon.
- **None:** The Diva LAN ISDN Modem discards all NetBIOS traffic. NetBIOS services are not supported across the ISDN link.

Enabling Spoofing of NetBIOS services

1. On the Manual configuration menu, click 'IP'.
2. Click 'General'.



3. Select the NetBIOS IP services option you require.
4. Click 'Save', then 'Reset'.

Data Compression

Data compression increases the effective throughput of a B-channel by encoding data so that fewer bits are required to represent it. Popular compression algorithms typically reduce the size of the data by 50 percent, effectively doubling the rate at which it is transmitted.

However, not all types of data lend themselves to such high compression ratios. If you are transmitting ZIP, JPG, GIF, MPEG, or other files that has already been storage-optimized, activating compression can have very little effect on throughput. This occurs because the compression algorithm can only achieve a small reduction in file size, which is offset by the processing overhead required for the sender to compress the file and the receiver to uncompress it. Therefore, you should determine if the traffic on your link is suitable for compression before you enable it.

The compression algorithm used is automatically negotiated by the Diva LAN ISDN Modem and the remote site when the connection is established. The Diva LAN ISDN Modem supports most popular compression standards, including Hi-fn STAC, Microsoft MPPC, and Ascend.

You can enable/disable compression for each connection profile individually.

1. From the web configuration menu, click 'Connection Profiles'.
2. Click the 'Edit' button next to the profile for which you want to configure compression.
3. Click 'Connection' on the menu bar. You will see the following page.

The screenshot shows a web interface titled 'Connection profiles' with a sub-tab 'Connection parameters'. The interface includes several input fields and checkboxes for configuring an ISDN connection. The fields are: 'Telephone number 1:', 'Telephone number 2:', 'Backup telephone number 1:', 'Backup telephone number 2:', 'ISDN call type:' (set to 'Normal'), 'Compression?' (checkbox), 'Manual dialing only?' (checkbox), 'Idle timer:' (set to 120 seconds), 'Max retries:' (set to 10), and 'Retry delay:' (set to 30 seconds). An arrow points from the text 'Compression option' to the 'Compression?' checkbox.

4. Select the 'Compression' box.
5. Click 'Finish', then 'Save', then 'Reset'.

Manual Dialing

ISDN active intervals lets you control costs by specifying time ranges when the ISDN link can be used. However, there may be certain situations where direct control of the ISDN link is more desirable. The manual dialing option gives you this control.

Each profile can be configured to use manual dialing only. If you enable this option and password protect the Diva LAN ISDN Modem, you effectively put ISDN access under direct manual control of authorized users only.

Enabling Manual Dialing

1. From the web configuration menu, click 'Connection Profiles'.
2. Click the 'Edit' button next to the profile you want to configure.
3. Click 'Connection' on the menu bar. You will see the following page:

'Manual Dialing Only' option

4. Select the 'Manual dialing only' box.
5. Click 'Finish', then 'Save', then 'Reset'.

Restricting Analog Calls

The settings at the beginning of this section mostly affect data calls. However, in some cases, you may want to place some restrictions on analog use of the ISDN line. Each phone port has a ‘type of calls’ setting which you can use for cost control purposes. It allows you to restrict traffic as follows:

- allow incoming calls only
- allow outgoing calls only
- allow all calls
- do not allow any calls

Restricting Analog Calls

1. From the web configuration menu, click ‘Manual Configuration’, then click ‘ISDN and Phone Ports’. Select the phone port from the drop-down menu.

ISDN phone line parameters

Define settings for: Phone port 1 *Select a port*

Main telephone number for this port:

Type of calls supported: All *Type of Calls Supported option*

Support modem/fax only? ☐

Enable distinctive ring? ☐

Enable call waiting? ☒

Additional telephone number for this port:

Reset form Save

2. Select an option from the ‘Type of calls supported’ drop-down menu.
3. Click ‘Save’ then ‘Reset’.

Data over Voice

In some regions, ISDN voice calls cost less than ISDN data calls. You can configure the Diva LAN ISDN Modem to take advantage of this discrepancy through the 'Data over Voice' option to reduce your ISDN charges. When you enable data over voice support, the Diva LAN ISDN Modem establishes all data calls as voice calls. This does not affect the throughput of your call; the only change is in how the call is billed.

Note: To use data over voice, the remote site you are calling must also support this feature.

Enabling Data over Voice

Data over voice can be enabled separately for each profile.

1. From the web configuration menu, click 'Connection Profiles'.
2. Click the 'Edit' button next to the profile you want to configure.
3. Click 'Connection' on the menu bar. You will see the following page:

The screenshot shows the 'Connection profiles' web interface. The 'Connection parameters' tab is active. The 'ISDN call type' dropdown is highlighted with an arrow and the label 'ISDN Call Type' option.

4. Set the 'ISDN call type' to one of the following options:
 - 'Normal' for connections at 64 kbps or 56 kbps
 - '56k rate' for connections at 56 kbps *only*.
5. Click 'Finish', then 'Save', then 'Reset'.

Traffic Filtering

By using the Diva LAN ISDN Modem's IP filters, you can selectively drop outgoing traffic to reduce your communications charges. This can be useful if you have applications on your LAN that regularly send non-critical traffic across the ISDN link.

For more information on filters, see [IP Filters](#) on page 155.

Configuring AO/DI

AO/DI lets you maintain a permanent connection to the Internet or a corporate network, without tying up an expensive ISDN B-channel. AO/DI accomplishes this by using the ISDN D-channel to establish a low-bandwidth (9.6 kbps) connection with your ISP or corporate network. When incoming or outgoing traffic exceeds the capabilities of the D-channel, AO/DI automatically invokes one or more B-channels to handle the increased traffic.

Some advantages of AO/DI include:

- Makes maintaining a permanent connection to the Internet more cost effective. With such a connection, remote users can connect with the Diva 1830 from any remote location that has Internet access. This eliminates the need to dial in via ISDN. (To make the connection permanent you must set the idle timer to 0. See [Idle Timer](#) on page 70.)
- Ideal solution for connecting to a remote corporate network, because low-bandwidth keep alive traffic can use the D-channel, instead of constantly bringing up a B-channel.

Note: *The 'D' indicator light on the front of the Diva LAN ISDN Modem will flash if AO/DI is configured but the X.25 data link layer on the D-channel cannot be established. If this occurs, most likely your provider does not support AO/DI or your X.25 settings are incorrect. In either case, check with your ISDN provider.*

Parameters

You customize how AO/DI opens and closes B-channels by setting the following parameters.

- **Delay for opening the 1st B-channel:** Sets the amount of time data traffic on the ISDN D-channel must exceed the specified Threshold value, for AO/DI to bring up the first B-channel.
- **Threshold for opening the 1st B-channel:** Sets the percentage of total bandwidth on the D-channel that must be exceeded, for AO/DI to bring up the first B-channel.
- **Delay for closing the 1st B-channel:** Sets the amount of time data traffic on the ISDN D-channel must be below the specified Threshold value, for AO/DI to drop the first B-channel.
- **Threshold for closing the 1st B-channel:** Sets the percentage of total bandwidth on the D-channel that traffic must be below, for AO/DI to drop the first B-channel.
- **Delay for opening the 2nd B-channel:** The amount of time data traffic on the first B-channel must exceed the specified Threshold value, for AO/DI to bring up the second B-channel.
- **Threshold for opening the 2nd B-channel:** Sets the percentage of total bandwidth on the first B-channel that must be exceeded, for AO/DI to bring up the second B-channel.
- **Delay for closing the 2nd B-channel:** Sets the amount of time data traffic on the first B-channel must be below the specified Threshold value, for AO/DI to drop the second B-channel.
- **Threshold for closing the 2nd B-channel:** Sets the percentage of total bandwidth on the first B-channel that traffic must be below, for AO/DI to drop the second B-channel.
- **Mode:** Determines ISDN line usage when AO/DI is enabled.
 - *D-Channel Only:* Data is only transferred on the D-channel.
 - *Normal:* Data is transferred on the D-channel, plus both B-channels if required.
- **Dial prefix:** Specifies the prefix to dial when making a call. For example, 1 to call long distance, or 9 to obtain an external line

- **X.25 transmit queue threshold:** Specifies the transmit queue threshold, in bytes, for X.25 on the D-channel. When queued data exceeds this limit, for the period of time specified for the parameter *Delay for opening the 1st B-channel*, the first B-channel is brought up. This parameter performs a similar function to *Threshold for opening the 1st B-channel*, and can be used concurrently with that parameter.

Configuring AO/DI

1. From the main menu, click 'Connection Profiles'.
2. Click 'Edit' for the profile you want to configure.

Connection profiles

Select a connection profile to edit.

	Profile	State		
1	ISP	Enabled	Edit	Dial
2	CORPORATE	Enabled	Edit	Dial

Configuration changes you Save when editing a profile are only activated after you click Reset.

Reset

3. Select 'MLPPP + AO/DI' as the protocol.

Connection profiles

Profile

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Profile name: ISP

Enable profile? ☒

Protocol: PPP (only 1 channel) More...

Backup profile: None

Profile restore delay: 0 seconds

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

'Protocol' setting

4. Click the 'More' button next to the Protocol field.

Connection profiles

Profile

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Profile name: ISP

Enable profile? ☒

Protocol: PPP (only 1 channel) More...

Backup profile: None

Profile restore delay: 0 seconds

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

'More' button

- Set the AO/DI parameters as required.

Connection profiles : AO/DI parameters

Delay for opening the 1st B-channel: seconds

Threshold for opening the 1st B-channel: %

Delay for closing the 1st B-channel: seconds

Threshold for closing the 1st B-channel: %

Delay for opening the 2nd B-channel: seconds

Threshold for opening the 2nd B-channel: %

Delay for closing the 2nd B-channel: seconds

Threshold for closing the 2nd B-channel: %

Mode:

Dial prefix:

Strip area code? ☐

X.25 transmit queue threshold:

- Click 'Save', but do not click 'Reset' yet. You must next configure the X.25 parameters. See the next section in this chapter.

Note: The 'D' indicator light on the front of the Diva LAN ISDN Modem will flash if AO/DI is configured but the X.25 data link layer on the D-channel cannot be established. If this occurs, most likely your provider does not support AO/DI or your X.25 settings are incorrect. In either case, disable AO/DI and check with your ISDN provider.

X.25 on the D-channel

During normal ISDN operation, the D-channel is used for signalling traffic purposes (call setup, call take down, caller ID, etc.) However, the full bandwidth of the D-channel is not needed for this. AO/DI takes advantage of the extra 9.6 kbps that is available to establish an X.25 packet-switched connection to a remote site.

Therefore, to take advantage of AO/DI, the remote site must support X.25 and you must properly configure the following X.25 settings on the Diva LAN ISDN Modem.

Note: The following parameters should be set based on the values supplied by your ISP or remote corporate network.

- Local DTE address:** Sets the X.25 DTE address assigned to the Diva LAN ISDN Modem. Specify up to 15 digits.
- Maximum window size:** Defines the maximum number of X.25 packets that can be outstanding (not acknowledged by the remote). When this number is reached, transmission is paused. Maximum window size can never be exceeded. If a larger window size is requested when the call is established, it is negotiated downward so that the Maximum window size is respected.
- Default window size:** The window size used when a X.25 call is made. This value cannot be larger than the value of *Maximum window size*.
- Maximum packet size:** The maximum size of an X.25 packet. Maximum packet size can never be exceeded. If a larger packet size is requested when the call is established, it will be negotiated downward so that the Maximum packet size is respected.
- Default packet size:** The packet size used when a X.25 call is made. This value cannot be larger than the value of *Maximum packet size*.

- **Number of VCs:** Specify the number of two-way virtual circuits supported on your D-channel. The Diva LAN ISDN Modem supports up to four VCs.
- **ISDN TEI type:** Determines how TEI assignment takes place.
 - Dynamic: TEIs are dynamically assigned by the switch.
 - Shared: Enables TEI sharing. Some switches only make two TEIs available for an ISDN line. Therefore, enable this option if you need three dynamically assigned TEIs (two B and one D). This shares the TEI between channels B1 and D. Requires AO/DI.
 - Static: Lets you manually specify the TEI assignment for the D-channel.
- **Static TEI number:** If static was selected for ISDN TEI type, enter the TEI number you want to assign to the D-channel.

Configuring X.25 settings

1. You should still be in the 'Connection Profiles' menu. Click 'Edit' for the profile you want to configure.

Connection profiles				
Select a connection profile to edit.				
	Profile	State		
1	ISP	Enabled	Edit	Dial
2	CORPORATE	Enabled	Edit	Dial

Configuration changes you Save when editing a profile are only activated after you click Reset.

Reset

2. Click 'Connection' on the menu bar. You will see the following page:

Connection profiles

Connection parameters

Profile | **Connection** | IP | RIP | Authentication | Callback | FINISH

Telephone number 1: 1

Telephone number 2: 1

Backup telephone number 1: 2

Backup telephone number 2: 2

ISDN call type: Normal

Remote X.25 address:

Compression? ☐

Manual dialing only? ☐

Idle timer: 120 seconds

Max retries: 25

Retry delay: 30 seconds

Profile | **Connection** | IP | RIP | Authentication | Callback | FINISH

3. Set the 'Remote X.25 address' parameter to the address of the remote site you want to communicate with.
4. Click 'Finish', then 'Save'. Do not click 'Reset'.

- Click the 'Manual Config' link at the top of the page, then click 'X.25'.

Main Menu **Manual Config** Profiles Maintenance Statistics

Menu

System System password, security, time, date and logging.	ISDN and phone ports ISDN telephone numbers and phone line setup.
LAN LAN IP address, LAN RIP configuration.	Cost control Billing intervals, idle timer and data call thresholds.
X.25 X.25 configuration and ISDN TEI settings.	Incoming data calls Enable incoming calls, set protocol to use, call screening.
IP Routes, filters, NAT, SNMP, DHCP, DNS, TFTP.	ISDN active Intervals. Limit ISDN usage by day and time
V.120 V.120 protocol configuration.	

Changes you make on these configuration pages are only activated when you click Reset.

'X.25' setting →

- Set the X.25 parameters as required.

Main Menu **Manual Config** Profiles Maintenance Statistics ?

X.25 parameters

Edit X.25 parameters

Local X.25 address:

Maximum window size:

Default window size:

Maximum packet size:

Default packet size:

Number of VCs:

ISDN TEI type:

Static TEI number:

- Click 'Save', then 'Reset'.

Phone Settings and Number Assignments

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Overview

You can connect any type of analog device (telephone, fax machine, analog modem) to the phone ports on the back of your Diva LAN ISDN Modem. Telephone features such as Call Waiting, Call Hold, Call Forwarding, Call Transfer, Call Redirection, Caller ID, Distinctive Ring, and others, are also supported.

This chapter explains how to configure the Diva LAN ISDN Modem to support these analog devices and to tailor phone settings to your needs. For example, you can assign certain phone numbers to specific ports.

Phone Number Assignments

The Diva LAN ISDN Modem provides flexible support for the assignment and setup of phone numbers. As you can have more than one ISDN phone number, there are several configuration options available.

For an overview of how phone assignments work, see:

- [If you have One ISDN Number](#) 87
- [If you have Multiple Numbers](#) 87

For instructions on defining number assignments using the web configuration interface, see:

- [Assigning Numbers with the Phone Line Wizard](#) 90
- [Assigning Phone Numbers with the ISDN Phone Line Page](#)..... 91

To assign specific numbers to data calls only, see [Configuring Phone Numbers for Data Calls](#) on page 92.

If you have One ISDN Number

If you have only one number assigned to your ISDN line, the same number is used for both data calls and voice calls.

When an incoming call is received, the Diva LAN ISDN Modem will automatically determine if the call is voice or data. Voice calls (including modem or fax calls) are routed to the phone ports. Data calls, if accepted by the Diva LAN ISDN Modem, are routed to your computer.

With only one number available, it is not necessary to configure the phone ports with your ISDN phone number. All phone ports will automatically answer incoming voice calls. However, you may wish to disable some phone ports altogether (see [Assigning Numbers with the Phone Line Wizard](#) on page 90). You also may want to set one port for incoming calls only and another for outgoing calls only (see [Restricting Analog Calls](#) on page 93).

If you have Multiple Numbers

If your ISDN provider supports Multiple Subscriber Numbering (MSN), it's possible to have more than two directory numbers assigned to your single ISDN line. The extra numbers can be used for a dedicated fax line; for example, or you can use them to help track costs.

Number assignment is done through the 'ISDN Phone Line' page (see [Assigning Phone Numbers with the ISDN Phone Line Page](#) on page 91). A telephone connected to a port that has more than one number will ring with a distinctive pattern when the second (or third) number is dialed, allowing you to identify incoming calls.

Data calls can also be assigned to two numbers. When making an outgoing data call, the Diva LAN ISDN Modem uses the main number to identify itself.

Multiple Number Assignment Examples

If you have five numbers assigned to your line, you could assign two numbers to the same port. Numbers 4 and 5 will ring with distinctive patterns to indicate the alternate number is being called.

Port	1st number	2nd number
Data calls (out)	main number	not applicable
PHONE port 1	number 2	number 4
PHONE port 2	number 3	number 5

If you have four numbers, you could assign them as follows. Numbers 3 and 4 will ring with distinctive rings to indicate the alternate number is being called. Notice that the number for data calls and phone port 2 is the same. The Diva LAN ISDN Modem determines the nature of an incoming call and will route the call to the appropriate place (an analog call to the phone port, a data call to your computer).

Port	1st number	2nd number
Data calls (in/out)	main number	not applicable
PHONE port 1	number 2	number 3
PHONE port 2	main number	number 4

Answering Calls Dialed to Unassigned Numbers

The Diva LAN ISDN Modem allows you to assign a port the status of having ‘no directory number’ (referred to as having been assigned a ‘blank’ DN). A port assigned a blank DN will answer any calls dialed to numbers not configured elsewhere.

For example, suppose you have four directory numbers assigned to your ISDN line: 555-1111, 555-2222, 555-3333, and 555-4444. You enter 555-1111 as the primary number for phone port 1 and 555-2222 as its secondary number. The primary and secondary numbers for phone port 2 is left blank.

In this scenario, a call placed to 555-1111 is sent to phone port 1. A call placed to 555-2222 is also sent to phone port 1 (as it is the secondary number for that port). However, a call placed to either 555-3333 or 555-4444, both of which have not been configured for a port, will be sent to phone port 2 automatically. This feature can be disabled.

Note on your ‘Main Number’

If you have multiple numbers assigned to your line, then one number (usually the first) is designated as the ‘main number’, ‘directory number’, or ‘number that appears on your phone bill’. This has significance for certain services like ‘Favorit Internet’ in Denmark, as their servers will reject your data call if you are not calling from your ‘main number’.

If you need to connect to a service with this type of restriction, make sure that your ‘main number’ is assigned to the data port (see [Configuring Phone Numbers for Data Calls](#) on page 92 for instructions).

Use of secondary numbers and TeleDanmark's Duet service

TeleDanmark's Duet service offers, as a package, a mobile phone number along with ISDN basic access and three directory numbers. With this service, if the mobile phone is switched off, calls placed to the mobile phone number are automatically forwarded to a specific directory number as assigned by TeleDanmark.

To make use of this service with the Diva LAN ISDN Modem, you would enter this 'mobile forwarding' number in the secondary number field in order to receive the forwarded calls.

For example, suppose you are assigned three numbers: 555-1111 (which you want to use for the telephone), 555-2222 (which you want to use for your fax), and 555-3333 (your mobile forwarding number). You connect your telephone to phone port 1 and your fax machine to phone port 2. To configure this on the Diva LAN ISDN Modem, you need to:

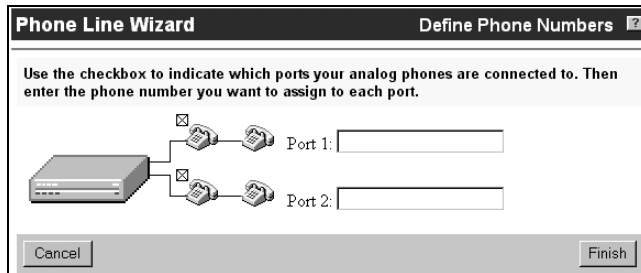
- Set the main telephone number of PHONE port 1 to 555-1111
- Set the additional telephone number for PHONE port 1 to 555-3333
- Set the main telephone number of PHONE port 2 to 555-2222

In this scenario, calls placed to your mobile phone are forwarded to 555-3333 if the mobile phone is not on. This way you know if a call has been forwarded from the mobile phone.

Assigning Numbers with the Phone Line Wizard

The Phone Line Wizard makes it easy to assign ISDN phone numbers to your phone ports.

1. From the main menu, click 'Phone Line Wizard'. The 'Phone Line Wizard' page appears.



2. Enter the phone numbers you want to assign to each port. If you do not have an analog device connected to a certain port, clear the check box associated with the port. If you want a port to answer on any dialed number (excluding numbers defined elsewhere), enable its check box but leave its phone number field blank.
3. Click 'Finish' when done. To specify more options, see [Assigning Phone Numbers with the ISDN Phone Line Page](#) on page 91.

Assigning Phone Numbers with the ISDN Phone Line Page

The 'ISDN Phone Line' page allows you to assign phone numbers to each port as well as change settings specific to that port.

1. From the web configuration menu, click 'Manual Configuration', then click 'ISDN and Phone Ports'.
2. Select a port from the 'Define settings for' drop-down menu.

ISDN phone line parameters

Define settings for: Phone port 1

Main telephone number for this port:

Type of calls supported: All

Support modem/fax only? ☐

Enable distinctive ring? ☐

Enable call waiting? ☒

Additional telephone number for this port:

Reset form Save

'Define settings for' drop-down menu

Main telephone number

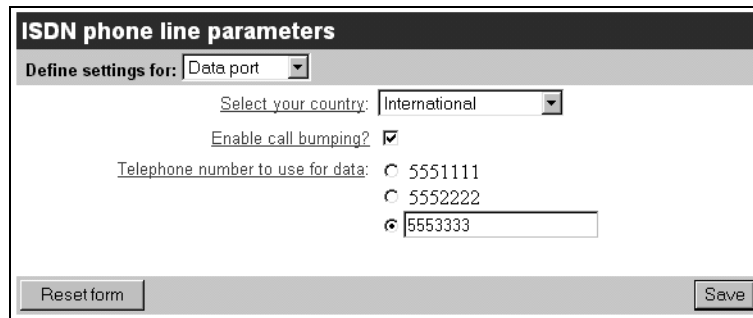
Optional telephone number

3. Enter your phone number in the 'Main telephone number for this port'. If needed, enter a second optional telephone number in the optional port.
4. By default, the two numbers have distinctive rings. The main telephone number will ring 'long, long, short', and the additional number will ring 'long, long'. If you check the 'Enable Distinctive Ring' option, the ring patterns are swapped (the main number will ring 'long, long' and the additional number will ring 'long, long, short').
5. Click 'Save', then 'Reset'.

Configuring Phone Numbers for Data Calls

Follow these steps to set the phone number to use for incoming and outgoing data calls.

1. From the main menu, click 'Manual Configuration', then click 'ISDN and Phone Ports'.
2. In the Define settings for box, choose 'Data port'. The Diva LAN ISDN Modem displays the following page:



The screenshot shows a web-based configuration window titled "ISDN phone line parameters". At the top, there is a dropdown menu labeled "Define settings for:" with "Data port" selected. Below this, there is a label "Select your country:" followed by a dropdown menu showing "International". Underneath, there is a label "Enable call bumping?" with a checked checkbox. The next section is labeled "Telephone number to use for data:" and contains three radio button options: "5551111", "5552222", and "5553333". The "5553333" option is selected. To the right of the radio buttons is a text input field containing "5553333". At the bottom of the window, there are two buttons: "Reset form" on the left and "Save" on the right.

3. Make a selection for the 'Telephone number to use for' data field.
 - The first two choices show the numbers assigned to Phone ports 1 and 2. (If you have not assigned phone numbers, these two choices will be blank). If you choose one of these numbers, then it will be shared for voice and data calls. The main drawback to sharing numbers is that only one port can use the number at a time. Therefore, if a voice call is in progress, data cannot be sent or received.
 - Use the third choice to specify a distinct number for data calls.
4. Click 'Save', then 'Reset'.

Restricting Analog Calls

The 'ISDN Phone Line' page gives you the option of restricting what types of calls a port should handle. This can be used for cost control purposes. Calls can be restricted to allow:

- incoming calls only
- outgoing calls only
- all calls
- no calls

Restricting Analog Calls

1. From the main menu, click 'Manual Configuration', then click 'ISDN and Phone Ports'.
2. Select the phone port from the drop-down menu.

ISDN phone line parameters

Define settings for: Phone port 1 *Select a port*

Main telephone number for this port:

Type of calls supported: All *'Type of Calls Supported' option*

Support modem/fax only? ☐

Enable distinctive ring? ☐

Enable call waiting? ☒

Additional telephone number for this port:

Reset form Save

3. Select an option from the 'Type of calls supported' drop-down menu.
4. Click 'Save' then 'Reset'.

Configuring a Port as Modem/Fax

If you are using an analog modem or fax machine on a phone port, you can configure the port as a 'Modem/Fax' port for better throughput. This sets the bearer capability of the outgoing call to 3.1 KHz audio, which provides better throughput when using faxes and modems. Support for supplementary services (Call Hold, Call Waiting, etc.) is disabled.

Note: You will still be able to make voice calls from this port if the 'Modem/Fax' option is enabled. However, some ISDN phones may not work in this mode.

Procedure

1. From main menu, click 'Manual Configuration', then click 'ISDN and Phone Ports'.
2. Select a port from the 'Define settings for' drop-down menu.

ISDN phone line parameters

Define settings for: Phone port 1

Main telephone number for this port:

Type of calls supported: All

Support modem/fax only? ☒

Enable distinctive ring? ☐

Enable call waiting? ☒

Additional telephone number for this port:

Reset form Save

3. Check the 'Support Modem/Fax Only' option.
4. Click 'Save', then 'Reset'.

Multiple Analog Devices on One Port

You can connect more than one phone (or analog device) to each of the phone ports.

One way to do this is to plug your existing telephone extension wiring (which has several telephone sockets chained together) into one of the Diva LAN ISDN Modem phone ports. The one phone port would then be available to all devices on your existing wiring.

You can also plug a telephone line splitter into the phone ports. However, some splitters are wide enough to block the other ports. If necessary, plug a short extension telephone cable into a port, then plug a splitter into the other end of the cable.

Note: *Each port has a REN value of 3. The total REN value for all analog devices connected to one port must not exceed this value.*

Call Bumping

Call Bumping (known as Dynamic Bandwidth Allocation, DBA), allows you to intelligently share the two B-channels of your ISDN line between data and analog calls. This allows you to send and receive faxes or make phone calls while downloading data from the Internet, for example.

How It Works

Call bumping ensures that a line is almost always available for your voice or fax calls, and works whether you make or receive a call. Here is an example:

- A data connection using MultiLink PPP (both B-channels used) is in progress. Throughput is at 128 kbps (two 64 kbps B-channels).
- A phone call arrives. As soon as the phone rings, one of the ISDN B-channels used for the data connection is automatically dropped, reducing throughput from 128 kbps to 64 kbps. The voice call is connected using the B-channel that was just disconnected.
- When the call is done, you hang up the phone. Automatically, the second B-channel connection is re-established for data transfer, bringing throughput back up to 128 kbps.

Requirements to Use Call Bumping

To use Call Bumping, you must set the connection protocol to Multilink PPP (MLPPP). See the section [Available Connection Protocols](#) on page 65 for more information on MLPPP. Also, your ISDN line must support the Call Waiting supplementary service.

Enabling Call Bumping

1. From main menu, click 'Manual Configuration', then click 'ISDN and Phone Ports'.
2. In the Define settings for box, choose 'Data port'. The Diva LAN ISDN Modem displays the following page:

ISDN phone line parameters

Define settings for: Data port

Select your country: International

Enable call bumping? ☒ ← 'Enable call bumping' check box

Telephone number to use for data: ☐ 5551111 ☐ 5552222 ☒ 5553333

Reset form Save

3. Select the 'Enable call bumping' check box.
4. Click 'Save', then 'Reset'.

Calling Features

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Overview

Your ISDN line may be provisioned with such calling features such as Call Hold, Call Forwarding, and others. These features are supplied by your ISDN provider, who will give you a list of features available as well as the keypad combinations you need to press in order to take advantage of such features. For example, in Europe, you can put a call on hold by press the **R** button on your telephone. If you wish to answer a second incoming call ('Call Waiting' feature), you would press **R** then **2**. Contact your ISDN provider for more information.

The Diva LAN ISDN Modem also supports certain supplementary features (such as Call Hold) even if your ISDN line is not provisioned for them.

Not all ISDN features are available or supported in all countries. Also, your ISDN subscription may not include a certain feature, even if it is available in your region. Contact your ISDN provider for more information.

If you attempt to use a calling feature that is not available to you, you will hear a 'service failure tone' (four beeps) through your telephone handset.

This section describes how to use the features supported by the Diva LAN ISDN Modem.

About the Feature Codes

The codes for ISDN features in your region may differ than those presented in this section. If a feature does not work, check with your ISDN provider for more information on what the codes should be.

Summary of Calling Features

The following tables summarize the features available through the Diva LAN ISDN Modem. Other features may be available to you; ask your service provider for more information. Each feature is described in more detail later in this chapter.

Diva LAN ISDN Modem Calling Features

The following table summarizes the calling features offered by the Diva LAN ISDN Modem.

Feature	Description
Call Hold	Call Hold lets you suspend your current call (placing it on hold), and make a second call to another destination.
Call Waiting	Call Waiting alerts you to a second incoming call during an active call. You can then place the active call on hold to take the new call.
Call Forwarding	When enabled, Call Forwarding automatically transfers incoming calls to another number.
Calling Party Identification (CID)	CID displays the number of an incoming call on the display of your phone.
Calling Party Identification on Call Waiting (CIDCW)	CIDCW displays the number of an incoming call on the display of your phone even if you are on the phone when another call comes in.
Calling Line Identity Presentation / Restriction	CLIR allows you to restrict calling line identity for outgoing calls on a per-call basis. This feature is supported on the phone ports only.
Malicious Caller Identification (MCID)	MCID allows you to register a calling number with your ISDN service provider. This feature requires that Call Hold be supported by your ISDN line.
Call Transfer between Ports	If two analog devices are connected to your Diva LAN ISDN Modem, this feature allows you to transfer a call from the device on one port to the device on the other (also referred to as 'internal transfer').
Three-party Conference Call	This feature lets you establish a call with two other people at the same time.
Terminal Portability	This feature allows you to transfer an active analog call from the Diva LAN ISDN Modem to another ISDN terminal (an ISDN phone, for example) that shares the same ISDN link.

Call Hold

Call Hold lets you suspend your current call (placing it on hold), and make a second call to another destination. You can then toggle back and forth between the two calls.

This feature is available as a service through your ISDN line (referred to as 'ISDN Call Hold') and also from the Diva LAN ISDN Modem itself (referred to as 'Diva Call Hold').

Using Call Hold

Code	Description
R	Places a call on hold so you can dial a second number. Once you hear a dialtone, you can place the second call.
R,2	Switches between the active and held call.
R,1	Disconnects the active call and continues with the other.

Notes

- If your phone is placed on-hook while an ISDN call is on hold, the connection remains active and full communication charges may apply. To indicate that a call is still on hold, the phone will ring for 30 seconds (15 seconds in Denmark and Sweden). After this time, the call is disconnected.
- It is possible to configure the Diva LAN ISDN Modem to hold calls even if this feature is not available on your ISDN line. See [Diva Call Hold](#) (below) for more information.

Diva Call Hold

The 'Call Hold' feature is normally handled by your ISDN provider. When you press **R** to put a call on hold, a message is sent to your provider's equipment (the 'switch') indicating the current call should be held.

However, the Diva LAN ISDN Modem can hold calls on its own, even if this feature is not available on your ISDN line. To do this, the Diva LAN ISDN Modem disconnects you from the call but leaves the connection open on its B-channel. You are then presented with a new dialtone.

Diva Call Hold is disabled by default.

Call Waiting

The Call Waiting Feature alerts you to a second incoming call during an active call. You can then place the active call on hold and connect to the second call.

This feature is available as a service through your ISDN line (referred to as 'ISDN Call Waiting') and also from the Diva LAN ISDN Modem itself (referred to as 'Diva Call Waiting').

Using Call Waiting

When you hear a Call Waiting alert, you can use one of the following codes.

Code	Description
R,0	Rejects the incoming call. The person making the call will hear a busy signal. Call Waiting will also be disabled for the duration of the call.
R,1	Disconnects the current call and accepts the incoming call.
R,2	Places the current call on hold and answer the incoming call. Once you have two calls (one active, one held), press R,2 to toggle between calls.

If you don't press any code, the 'Call Waiting' alert will repeat once more, ten seconds later. The person making the call will continue to hear the phone ring.

Enabling and Disabling Call Waiting via a Touch Tone Phone

To enable or disable Call Waiting via a touch tone phone, lift the receiver, wait for a dialtone, then press one of the following:

Code	Description
*43#	Enables Call Waiting. You will hear three rising tones in confirmation.
#43#	Disables Call Waiting. You will hear three falling tones in confirmation.
*#43#	Determines if Call Waiting is enabled or disabled. If enabled, you will hear three rising tones; if disabled, you will hear three falling tones.

Enabling and Disabling Call Waiting via the Web Interface

To enable or disable Call Waiting via the web interface:

1. From the web configuration menu, click 'Manual Configuration', then 'ISDN and Phone Ports'.
2. In the 'Define settings for' box, choose the phone port you want to configure.

The screenshot shows a web form titled "ISDN phone line parameters". At the top, there is a dropdown menu labeled "Define settings for:" with "Phone port 1" selected. Below this, there are several input fields and checkboxes: "Main telephone number for this port:" (empty), "Type of calls supported:" (dropdown menu set to "All"), "Support modem/fax only?" (checkbox, unchecked), "Enable distinctive ring?" (checkbox, unchecked), and "Enable call waiting?" (checkbox, checked). At the bottom, there is another input field labeled "Additional telephone number for this port:" (empty). Two buttons, "Reset form" and "Save", are at the bottom right. Two annotations with arrows point to the form: one points to the "Define settings for:" dropdown menu, and the other points to the "Enable call waiting?" checkbox.

3. Select 'Enable call waiting'.
4. Click 'Save', then 'Reset'.

Notes

- The Diva Call Waiting feature uses the second B-channel (if available) to receive a second incoming call and offer it to you. However, if both B-channels are in use, the Diva LAN ISDN Modem cannot offer the call, and the second caller will hear a busy signal.
- If Call Waiting is not provisioned on your ISDN line, Call Bumping will not occur, as MultiLink PPP uses the Call Waiting signalling information from your service provider to determine if it should release a B-channel to accommodate an incoming voice call. See [Call Bumping](#) on page 96 for more information.

Call Forwarding

When enabled, Call Forwarding automatically transfers incoming calls to another number. Call Forwarding is available from your provider.

Types of Call Forwarding Assignments

You can assign up to three types of Call Forwarding to each phone port.

- ‘Call Forwarding Unconditional’: Always forward incoming calls to the specified number. The main keycode for this feature is ‘21’. See [Using Call Forwarding Unconditional](#) on page 103 for instructions.
- ‘Call Forwarding No Reply’: Forward incoming calls when a call is not answered after a user-specified number of rings. The main keycode for this feature is ‘61’. See [Using Call Forwarding No Reply](#) on page 103 for instructions.
- ‘Call Forwarding Busy’: Forward incoming calls when the line is busy. The main keycode for this feature is ‘67’. See [Using Call Forwarding Busy](#) on page 104 for instructions.

In addition, your ISDN provider may allow other types of Call Forwarding assignments. Contact your provider for further details.

Using Call Forwarding Unconditional

Call Forwarding Unconditional allows you to forward all incoming calls to a specified number. Call Forwarding Unconditional takes precedence over Call Forwarding No Reply and Call Forwarding Busy.

To use this feature, lift the receiver, wait for a dial tone, then press the appropriate keypad code as described in the following table.

Code	Description
*21*num#	Unconditionally forwards all calls to ‘num’. Replace ‘num’ with the forwarded-to number. Once you press #, you will hear three rising tones in confirmation.
#21#	Deactivates this feature. You will hear three falling tones in confirmation.
*#21#	Returns the status of this feature. If enabled, you will hear three rising tones; if disabled, you will hear three falling tones.

Using Call Forwarding No Reply

Call Forwarding No Reply forwards incoming calls only when a call is not answered after a certain number of rings. You can specify the number of rings or use the default value.

Code	Description
*61*num#	Forwards an incoming call to ‘num’ if the call is not answered after the default number of rings. Replace ‘num’ with the forwarded-to number. The default number of rings is 3. Once you press #, you will hear three rising tones in confirmation.
*61*num*rings#	Forwards an incoming call to ‘num’ if the call is not answered after the amount of rings specified. Replace ‘num’ with the forwarded-to number and ‘rings’ with the number of times your phone should ring before the call is forwarded. Once you press #, you will hear three rising tones in confirmation.

Code	Description
#61#	Deactivates this feature. You will hear three falling tones in confirmation.
*#61#	Returns the status of this feature. If enabled, you will hear three rising tones; if disabled, you will hear three falling tones.

Using Call Forwarding Busy

Call Forwarding Busy forwards incoming calls only when a call is busy.

Code	Description
*67*num#	Forwards an incoming call to 'num' if the line is busy. Replace 'num' with the forwarded-to number. Once you press #, you will hear three rising tones in confirmation.
#67#	Deactivates this feature. You will hear three falling tones in confirmation.
*#67#	Returns the status of this feature. If enabled, you will hear three rising tones; if disabled, you will hear three falling tones.

Notes

- You can assign all three Call Forwarding types for a particular port at the same time, and each feature can be assigned its own forward-to number. However, Call Forwarding Unconditional, if active, takes precedence over the other two Call Forwarding features. For example, if Call Forwarding Unconditional and Call Forwarding Busy are both enabled, an incoming call will be sent to the forwarded-to number assigned by Call Forwarding Unconditional, even if you are on the phone at the time.
- To determine if at least one of the Call Forwarding features is currently active for a phone port, lift the receiver and listen for a dial tone. If the tone is fast and intermittent, at least one of the Call Forwarding features is active. If the tone is continuous, no Call Forwarding features are active. (May not work in all regions.)
- If you hear a busy signal while programming a Call Forwarding feature, most likely the keypad combinations were entered incorrectly. Hang up and try again.

Calling Party Identification (CID)

Calling Party Identification (CID)

With this feature, the number of an incoming call is automatically shown on the display of your telephone. Based on this information you can answer or ignore the call.

This feature is supported in Australia, China, Denmark, France, Germany, Hong Kong, Ireland, the Netherlands, Singapore, Sweden, the United Arab Emirates, and the United Kingdom. Other regions may support this feature in the future. Check with your ISDN provider.

Calling Party Identification on Call Waiting (CIDCW)

With this feature, the number of a second incoming call is shown on the display of your telephone at the same time you hear a Call Waiting alert, if you are currently on the line.

Note: *In Denmark (where this feature is known as CallerID Plus), the identity of the second call is not displayed automatically. When you hear a call waiting alert, you must press **R,9**.*

This feature is supported in Australia, China, Denmark, Hong Kong, Ireland, Singapore, the United Arab Emirates, and the United Kingdom. Other regions may support this feature in the future. Check with your ISDN provider.

Calling Line Identity Presentation / Restriction

Calling Line Identify Presentation (CLIP) and Calling Line Identify Restriction (CLIR) allow or restrict calling line identity for your outgoing calls on a per-call basis. To use this feature, you must enter a code before dialing a number. The code you press may be different depending on the region.

United Kingdom and Ireland

Code	Description
141	Enables CLIR for a new call. You must dial 141 before dialing the destination number. For example, if you were calling 5551234, you would dial 1415551234.
1470	If you have CLIR permanently enabled on your line, you can temporarily disable it using the prefix 1470 .

All Regions except United Kingdom and Ireland

Code	Description
*31#	Enables CLIR for a new call. Lift the receiver, dial *31# , then dial the number.
#31#	If you have CLIR permanently enabled on your line, you can temporarily disable it using the prefix #31# .

The codes in your region may differ than those presented here. Check with your ISDN provider for more information.

Feature Support

This feature is supported in all countries. However, it may not be offered by your ISDN provider. Check with your provider for more information.

Malicious Caller Identification (MCID)

Malicious Caller Identification allows you to register a calling number with your ISDN service provider. This feature requires that Call Hold be supported by your ISDN line.

Using Malicious Caller Identification

Code	Description
R,*39#	Invokes Malicious Caller Identification for the active call. If you are on a call when you first press R , you should hear a dialtone. After you press *39# , you are automatically reconnected to the call. You can also invoke this feature 30 seconds after the caller has hung up.

Feature Support

This feature is supported in all countries except Australia.

Call Transfer between Ports

This feature lets you transfer a call from one port to another. For example, you can transfer a call from the phone on port PHONE 1 to the phone on port PHONE 2. To receive the transferred call, the second device must be on hook and not ringing.

Using Call Transfer

To	Follow these steps
Transfer the active call with no call on hold	1. Press R to put the active call on hold. You will hear a dialtone. 2. Press *. 3. Hang up the phone. The call is transferred to the other phone port and the phone connected to this port rings. 4. When the second analog device answers, the transfer is complete. If you decide to cancel the transfer, press *R before the call is answered.
Transfer the active call if you already have a call on hold	For the following procedure, 'call 1' refers to the active call and 'call 2' refers to a call initially on hold. 1. Press R. Call 1 is put on hold (you will hear a dialtone). 2. Press *. Call 1 is transferred to the other phone port and the device connected to this port rings. You are automatically reconnected to Call 2. 3. When the second device answers, the transfer is complete. If you decide to cancel the transfer, press *R before the call is answered. Note that you cannot retrieve Call 1 without disconnecting from Call 2.

Resuming a Transferred Call

Once a call has been transferred, you can take back the call. Lift the receiver, and press ***R**.

Notes

- If the target device cannot accept the redirected call (it is busy or ringing), the device initiating the transfer will ring. The call can then be answered by the initiating device and communication re-established.
- If the second device does not answer within 30 seconds (90 seconds in Denmark and Sweden), the call is cleared. Communication charges may apply while the transferred call is ringing (see [Call Hold](#) on page 100).

Three-party Conference Call

This feature lets you speak with two other people over the phone at the same time. Once a Three-party Conference Call is set up, you may drop a call and continue with the other caller, or you put the one caller on hold while staying connected to the other caller.

Code	Description
R,3	Establishes a Three-party Conference Call with two currently-held calls. Follow these steps to set up the call: 1. Dial the first number. 2. After you connect with the first person, press R. You will hear a dialtone. 3. Dial the second number. 4. After you connect with the second person, press R again. You will hear a dialtone. 5. Press 3 to connect all three parties at once.
R,1	Disconnects the call you connected last, allowing you to continue talking to the remaining caller.
R,2	Places the call connected last on hold, allowing you to talk exclusively with the caller connected first. At this point you can press R,1 to disconnect the current call and switch to the call on hold; R,2 to switch between the two calls; or R,3 to re-establish the conference call.

Terminal Portability

Terminal Portability allows you to transfer an active ISDN call from the Diva LAN ISDN Modem to another ISDN terminal (an ISDN phone, for example) that shares the ISDN link with (but is not connected to) the Diva LAN ISDN Modem. Both the Diva LAN ISDN Modem and the other device must be using the same BRI.

Using Terminal Portability

When you transfer a call using this feature, you have the option of giving the call an identity number. This feature may not be supported in all regions.

Code	Description
R,*79#	Transfers the active call to a separate ISDN device. When you first press R, you should hear a dialtone. After you press *79#, you should again hear a dialtone, indicating the call has been transferred. You can then hang up the phone. If the transfer fails, you will not hear a dialtone and you will be reconnected to the active call. To resume a transferred call, lift the receiver and press *79#.
R,*79*num#	Transfers the active call (giving the call an identity number) to a separate ISDN device. Replace num with a one, two, or three digit number. When you first press R, you should hear a dialtone. After you press *79#, you should again hear a dialtone, indicating the call has been transferred. You can then hang up the phone. If the transfer fails, you will not hear a dialtone and you will be reconnected to the active call. To resume a transferred call that has been given an identity number, lift the receiver and press *79*num#, with num being the identity number.

Security

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Overview

Connecting your computers to the internet or a remote corporate LAN creates a wide range of benefits, but also exposes your computers to certain risks. To safeguard your data and systems, the Diva LAN ISDN Modem provides a comprehensive range of security features. This section explains how to use and configure each feature for optimal protection of your systems.

Security Features Summary

This table lists all security features offered by the Diva LAN ISDN Modem, and their default settings.

Feature	Default	Description
System password	None	Restricts access to the Diva LAN ISDN Modem configuration interfaces.
Automatic log out	Active	Automatically terminates idle configuration sessions.
Network address translation (NAT)	Active	NAT hides the addresses of the computers on the internal Ethernet LAN from the external network.
Remote management	Disabled	Permits remote systems to log on to the Diva LAN ISDN Modem web configuration interface (from the Internet, for example).
Incoming data calls	Disabled	Permits the Diva LAN ISDN Modem to answer incoming calls.
Call screening	Disabled	Allows you to accept incoming data calls from specific phone numbers only.
Call authentication	Always authenticate	Lets you respond to authentication requests when making outgoing data calls, or validate incoming calls.
Callback	Disabled	Forces the remote site to call back to establish the connection.
Manual dialing	Disabled	Lets you manually control when the ISDN link is established.
Custom security using IP filters	None	Lets you filter specific IP datagrams for security reasons.

The following table lists the security features that can be applied, to restrict access to the Diva LAN ISDN Modem configuration interfaces.

Source system	Connection	Security features that apply
Remote computer	ISDN	System password Automatic log out Remote Management Answer incoming data calls Call screening Call authentication Custom security using IP filters
Local computer	Ethernet	System password Automatic log out Custom security using IP filters
Local Computer	Serial	System Password
Telephone	Phone port	Only available when the ISDN is not connected

System Password

The Diva LAN ISDN Modem provides a system password that restricts access to the Web-based configuration interface and the command line interface. This ensures that configuration changes can only be made by authorized personnel.

By default, no password is defined.

Setting a System Password

1. From the web configuration menu, click 'Manual Configuration', then 'System'.
2. Enter the new system password in the 'Login Password' and 'Repeat Login Password' fields.

System parameters
Edit system parameters
Current firmware revision: 2.0

System name: diva lanmodem

Login password:

Repeat login password:

Enable remote management: ☐

Set time: 14 : 51 : 57 (HH:MM:SS)

Set date: 2001 - 03 - 1 (YYYY-MM-DD)

Get time and date

Log output: Send to remote Remote IP address: 255.255.255.255 (if log sent to remote)

Cancel Reset form Save

3. Click 'Save' then 'Reset'.

Forgot your Password?

If you have forgotten your password, the only way to gain access to the configuration pages is to reset the Diva LAN ISDN Modem to its factory defaults. See [Resetting the Device](#) on page 50 for more information.

Resetting the device also returns all configuration settings, including username and password information for Internet access, to factory defaults.

Removing the Password

1. Login and access the 'System' page as described above.
2. Delete the text from both login fields.
3. Click 'Save', then 'Reset'.

Automatic Log Out

The Diva LAN ISDN Modem applies an automatic timeout to configuration sessions. When a configuration session is idle for more than the timeout value, the Diva LAN ISDN Modem automatically logs the user out. This reduces the risk of unauthorized persons taking advantage of a logged-in computer that has been left unattended.

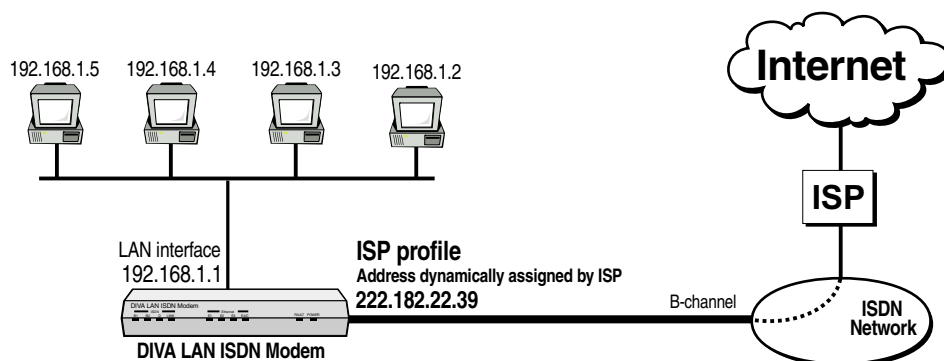
- Web interface: 30 minutes.
- Telnet session (for entering text commands): 5 minutes.
- Serial port with console cable: no timeout limit.

The timeout values are not configurable.

Note: *Changes that have not been saved are lost when the configuration session is terminated.*

Network Address Translation (NAT)

The Diva LAN ISDN Modem uses network address translation (NAT) to ‘hide’ the local LAN from all external resources. The benefits of this are the ability for all connected computers to access the Internet using one Internet address and ISP account. For example, when communicating with the Internet, the four computers in the following diagram share the dynamically assigned address ‘222.182.22.39’.



Notes

- NAT operates transparently, translating internal addresses to a single external one for all data traffic. There is no effect on throughput.
- Most applications will work with NAT. For a list of applications that have been tested by Eicon Networks, see the release notes on the Diva LAN ISDN Modem CD.
- NAT is enabled by default, and it is recommended that you do not turn it off unless you have a specific requirement to do so. (For more information on IP addressing see [Incoming calls and IP addressing](#) on page 121)

Security benefits

An additional benefit of NAT is increased network security. Like a firewall, NAT restricts access to the computers that reside on the local LAN. By default, no computer on the internal LAN is visible to the external network. Computers on the internal network cannot act as FTP or web servers, nor can they share their drives using Windows Network Neighborhood. These security features can be weakened if you use NAT static mappings (see [NAT static mappings](#) on the following page).

NAT static mappings

With NAT enabled, computers outside of the internal LAN do not have access (are not visible) to any computers on the internal LAN. If you need a computer on the internal LAN to be visible to the external network (such as a web server), the Diva LAN ISDN Modem provides a solution through NAT static mappings.

How It Works

NAT static mappings permits you to allow specific computers on the internal LAN to receive certain incoming network traffic. For example, you could designate a computer to receive all incoming HTTP traffic, allowing it to function as a web server. However, the actual IP address of this computer is still hidden by NAT. Therefore, remote users must specify the address of the Diva LAN ISDN Modem to gain access to the web server.

When you create a NAT static mapping, the Diva LAN ISDN Modem routes *all* traffic for the protocol you specify to the designated computer. This includes traffic normally handled by the Diva LAN ISDN Modem itself. This leads to the following restrictions:

- Remote access to the configuration interfaces on the Diva LAN ISDN Modem via the ISDN link can be disrupted. For example, if you designate a computer to receive HTTP traffic, remote access to the web configuration interface will be disrupted. However, local access via Ethernet will still be possible.
- Only *one* computer on the internal LAN can be designated to receive the traffic for a *specific* protocol. This means, for example, you cannot create multiple web servers; all web traffic must be sent to one computer on your LAN.

Creating Static NAT Mappings

1. From the main menu, click 'Manual Configuration', then click 'IP'.
2. From the 'IP' menu, click 'NAT static mappings'.

Map	Protocol	Server port	Server IP address
1	None	0	0.0.0.0
2	None	0	0.0.0.0
3	None	0	0.0.0.0
4	None	0	0.0.0.0
5	None	0	0.0.0.0
6	None	0	0.0.0.0
7	None	0	0.0.0.0
8	None	0	0.0.0.0

3. For each server that you want to define, specify the following parameters:
 - 'Protocol': Select the protocol that remote computers will use to access the server.
 - 'Server port': Enter the port number that the protocol will use on the server.
 - 'Server address': Enter the IP address of the computer that will act as the server. The server address must be on the same LAN as the Diva LAN ISDN Modem (or must be reachable via the LAN).
4. Click 'Save' then 'Reset'.

Default NAT Server

When the Diva LAN ISDN Modem receives incoming datagrams containing protocols it is not supposed to accept, the datagrams are discarded. For example, if an incoming datagram contains an FTP request, and no FTP server has been defined using a static mapping, the datagram is discarded.

In some cases, you may want to forward all datagrams containing unspecified protocols to a computer on your LAN. The Diva LAN ISDN Modem calls this computer the 'default NAT server'.

To define a default NAT server, enter the IP address of the device that should receive these datagrams into the 'Default NAT server' field on the IP Parameters panel.

IP parameters : NAT static mappings

Default NAT server

Default NAT server: 0.0.0.0 ← 'Default NAT Server' field

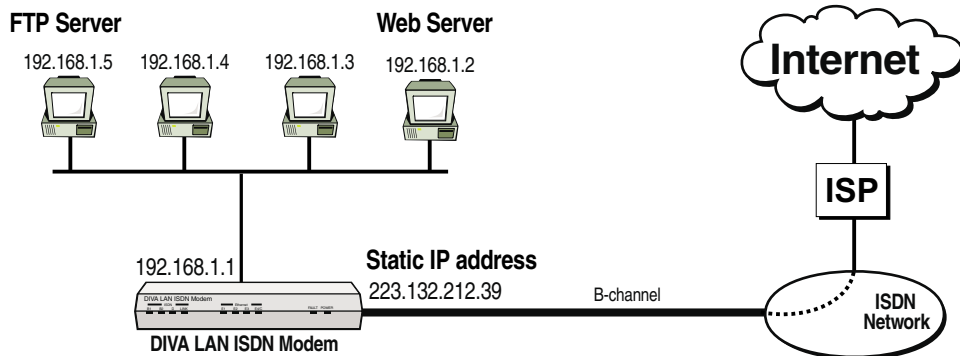
Edit NAT static mappings

Map	Protocol	Server port	Server IP address
1	None	0	0.0.0.0
2	None	0	0.0.0.0
3	None	0	0.0.0.0
4	None	0	0.0.0.0
5	None	0	0.0.0.0
6	None	0	0.0.0.0
7	None	0	0.0.0.0
8	None	0	0.0.0.0
9	None	0	0.0.0.0
10	None	0	0.0.0.0

Note: The Diva LAN ISDN Modem handles traffic with the following protocols: HTTP, Telnet, TFTP, ECHO (UDP port 7), and SNMP. Only traffic that does not contain these protocols will be forwarded to the default NAT server. To forward the aforementioned protocols you must define a NAT static mapping for each one.

Example: Allowing Web or FTP Request using NAT Static Mappings

Two of the most common reasons to use NAT static mappings are to run a web server or FTP server on a computer connected to the Diva LAN ISDN Modem. Use the following diagram as a reference as you examine the NAT mapping examples that follow. Note that the Diva LAN ISDN Modem has been assigned the static IP address 223.132.212.39.



Configuring for Web Traffic

Web traffic is carried on TCP port 80 and is destined for the computer at IP address 192.168.1.2. Therefore, the following NAT mapping would be required:

Map	Protocol	Server port	Server IP address
1	TCP	80	192.168.1.2

To access the web server, a remote computer uses the URL `HTTP://223.132.212.39/`. The Diva LAN ISDN Modem sees that the datagram is intended for port 80 and forwards all web traffic to the appropriate computer on the internal LAN.

Note that setting up a web server disables remote access via the ISDN line to the Diva LAN ISDN Modem web interface. However, computers on the internal LAN can still log in.

Configuring for FTP Traffic

FTP traffic is carried on TCP ports 20 and 21 and is destined for the computer at IP address 192.168.1.5. Therefore, the following two NAT mappings would be required:

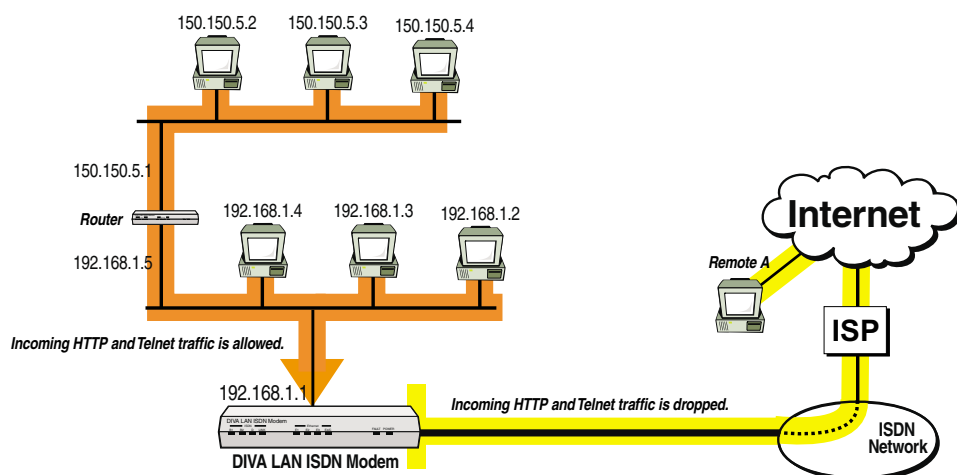
Map	Protocol	Server port	Server IP address
1	TCP	20	192.168.1.5
2	TCP	21	192.168.1.5

Remote Management

By default, the Diva LAN ISDN Modem does not allow remote devices to access its configuration interfaces via the ISDN link. This prevents unauthorized tampering when the Diva LAN ISDN Modem has dialed out and is connected to the Internet or to a remote corporate network.

To accomplish this security, all incoming HTTP and Telnet traffic on the ISDN line is automatically dropped. This effectively blocks remote computers from using the web-based interface.

This does not affect traffic on the local LAN created by the Diva LAN ISDN Modem. Therefore, if the local LAN is connected to other networks, these computers will have access to the Diva LAN ISDN Modem. Consider the following topology:



In the above example, all computers on the two LANs have access to the Diva LAN ISDN Modem configuration interfaces. However, remote computer A is blocked as it must go through the ISDN line to access the Diva LAN ISDN Modem.

Note: Remote security is implemented using IP filtering (see [IP Filters](#) on page 155). Removing these filters will affect remote security.

Incoming data calls

By default, the Diva LAN ISDN Modem refuses all incoming ISDN data calls. This effectively shuts the door on unauthorized systems dialing-in. (Voice calls are not blocked by this setting.)

When support for incoming data calls is activated and an incoming call is received, the Diva LAN ISDN Modem compares the user name and password supplied by the remote site against the remote user name and remote password configured for the ISP profile, then the CORPORATE profile. If a match is found, the call is accepted. Otherwise, the call is rejected. Therefore, to accept incoming data calls you must define call authentication settings for the appropriate profile (as explained in the steps below).

Since the Diva LAN ISDN Modem checks the ISP profile first, if both profiles have the same remote user name, the incoming call will always connect with the ISP profile.

Incoming data calls can only be received if there is an available B-channel. To keep a free channel, you must use PPP (or V.120) for your existing connection. If you are using MLPPP, you will only be able to receive incoming voice calls if no data call is active. See [Selecting a Connection Protocol](#) on page 65 for more information.

When you enable callback support (page 127) using the web configuration interface, the Diva LAN ISDN Modem automatically enables support for incoming data calls.

Incoming calls and IP addressing

For an incoming call to successfully connect, you must define a proper IP addressing scheme for the profile that will handle the connection. This means setting the following three parameters: *IP address*, *Subnet mask*, and *Remote IP address*.

Generally, when you configure the Diva LAN ISDN Modem to connect to the Internet, you set the *IP address* parameter to 0.0.0.0, which means that the address will be dynamically assigned by the ISP when the profile connects. When you receive an incoming call however, it may be the responsibility of the Diva LAN ISDN Modem to assign an IP address to the caller. In this case, the static address you set for *Remote IP address* would be adopted by the caller.

The following diagram illustrates the effects of potential addressing schemes. (The subnet mask is omitted from this discussion, but should be set to match the IP address. See [About IP addresses](#) on page 147 for more information on masks.)

	DIVA LAN ISDN Modem		Remote Computer
1	IP address: <i>static</i> Remote IP address: <i>static</i>	Assigned to	IP address: <i>dynamic</i> Remote IP address: <i>dynamic</i>
2	IP address: <i>static</i> Remote IP address: <i>dynamic</i>	No assignments	IP address: <i>static</i> Remote IP address: <i>dynamic</i>
3	IP address: <i>static</i> Remote IP address: <i>static</i>	Addresses must match	IP address: <i>static</i> Remote IP address: <i>static</i>
4	IP address: <i>dynamic</i> Remote IP address: <i>dynamic</i>	Assigned to	IP address: <i>static</i> Remote IP address: <i>static</i>
5	IP address: <i>static</i> Remote IP address: <i>dynamic</i>	Fails	IP address: <i>dynamic</i> Remote IP address: <i>dynamic</i>
6	IP address: <i>dynamic</i> Remote IP address: <i>dynamic</i>	Fails	IP address: <i>static</i> Remote IP address: <i>dynamic</i>
7	IP address: <i>dynamic</i> Remote IP address: <i>dynamic</i>	Fails	IP address: <i>dynamic</i> Remote IP address: <i>dynamic</i>

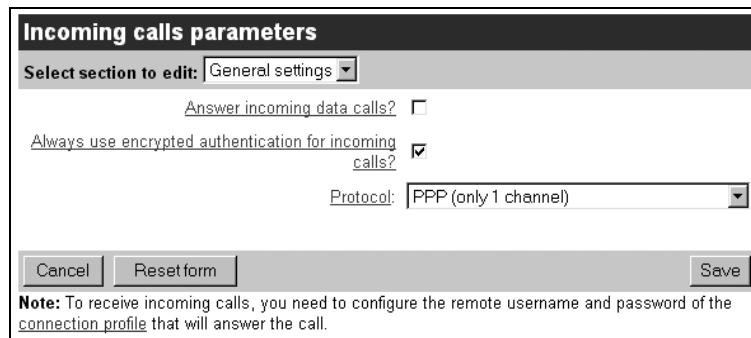
Notes on the diagram

1. The Diva LAN ISDN Modem provides an IP address to the remote computer.
2. Both the Diva LAN ISDN Modem and the remote computer have their own fixed IP addresses so no assignments are made.
3. Both the Diva LAN ISDN Modem and the remote computer have their own fixed IP addresses AND have specified remote addresses. This means they will only be able to connect if the remote addresses match the IP addresses of the other device.
4. The remote computer provides an IP address to the Diva LAN ISDN Modem.
5. The remote computer has no IP address and the Diva LAN ISDN Modem is not configured to supply one.
6. The Diva LAN ISDN Modem has no IP address and the remote computer is not configured to supply one.
7. Neither device has an IP address and neither is configured to supply one.

Enabling support for incoming data calls

To turn on and configure support for incoming calls, do the following:

1. On the Manual Configuration menu, click 'Incoming data calls'. This displays the Incoming calls parameters page.



Incoming calls parameters

Select section to edit: General settings

Answer incoming data calls? ☐

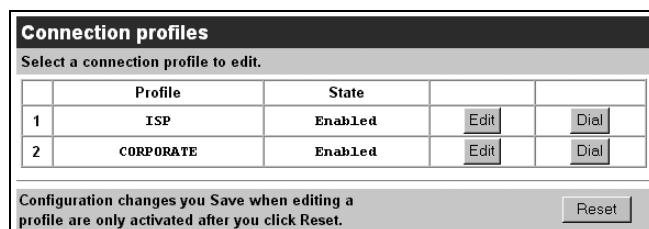
Always use encrypted authentication for incoming calls? ☒

Protocol: PPP (only 1 channel)

Cancel Reset form Save

Note: To receive incoming calls, you need to configure the remote username and password of the connection profile that will answer the call.

2. Select 'Answer incoming data calls'.
3. Specify the type of password the Diva LAN ISDN Modem expects the remote to send: encrypted or any (unchecked). If the supplied password is not in the proper format the call is rejected.
4. Choose the type of connection protocol to use for the call. The setting you make here takes precedence over the setting for the profile that will answer the call.
5. Click connection profile in the 'Note' at the bottom of the page. The Diva LAN ISDN Modem displays the Connection profiles list page.



Connection profiles

Select a connection profile to edit.

	Profile	State		
1	ISP	Enabled	Edit	Dial
2	CORPORATE	Enabled	Edit	Dial

Configuration changes you Save when editing a profile are only activated after you click Reset.

Reset

6. Click 'Edit' for the profile that will answer the call.
7. Click 'Authentication'.
8. Define the 'Remote username' and 'Remote password' the Diva LAN ISDN Modem expects the remote to send. See [Call Authentication](#) on page 126 for more information.

9. Click 'IP'.
10. Set 'IP address', 'Subnet mask', and 'Remote IP address' as required.
11. Click 'Finish', then 'Save', then 'Reset'.

Call screening

Call screening enables you to accept or reject incoming data calls based on their phone number. This is an effective way to limit dial-in access to the Diva LAN ISDN Modem to a small group of remote sites.

Entering calls to be screened

1. From the Manual Configuration menu, click 'Incoming data calls'.
2. In the Define settings for box choose 'Call screening'. You will see the following page.

First ISDN number	Second ISDN number

3. Check the 'Enable call screening' box.
4. Enter the phone numbers of the remote sites you want to receive calls from. Enter the same phone number under 'First ISDN number' and 'Second ISDN number'.
5. Click 'Save', then 'Reset'.

Enabling Remote Management

If you want to support remote configuration, you must enable the remote management option. This option can only be set with the web-based configuration interface.

1. From the web configuration menu, click 'Manual Configuration', then click 'System'.
2. Check the 'Enable remote management' check box.

The screenshot shows the 'System parameters' web configuration interface. The title bar says 'System parameters' and 'Edit system parameters'. The current firmware revision is 2.0. The form includes fields for 'System name' (diva), 'Login password', 'Repeat login password', 'Enable remote management' (checkbox), 'Set time' (14:51:57), 'Set date' (2001-03-1), 'Log output' (Send to remote), and 'Remote IP address' (255.255.255.255). The 'Enable remote management' checkbox is highlighted with an arrow and the text 'Enable Remote Management' option.

3. Click 'Save' then 'Reset'.

Note: If you enable remote management, it is strongly suggested that you define a log in password. This parameter is available on the same page as the remote management option (see [System Password](#) on page 114 for more information).

Call Authentication

Call authentication enables ISDN devices, like the Diva LAN ISDN Modem, to validate the identity of the device at the other end of the line. Authentication works through the exchange of usernames and passwords. It can be one-way (either the caller gets validated or the callee gets validated) or two-way (both sides validate each other).

Generally, authentication is one-way, with the caller getting validated. For example:

- When the Diva LAN ISDN Modem calls an ISP or a corporate network, it will be authenticated (i.e., it must supply a username and password to log on).
- When a remote computer calls the Diva LAN ISDN Modem, it will be authenticated (i.e., it must supply a username and password for the call to be accepted).

To successfully use call authentication it is important that both devices are configured to support the same authentication options.

Setting up Call Authentication

1. From the web configuration menu, click 'Connection Profiles'.
2. Click the 'Edit' box next to the profile you want to configure.
3. Click 'Authentication' on the menu bar. You will see the following page:

The screenshot shows a web interface titled "Connection profiles" with a sub-header "Authentication parameters". Below this, there are navigation tabs: "Profile", "Connection", "IP", "RIP", "Authentication" (which is selected), "Callback", and "FINISH". The main content area contains the following fields and options:

- Local username:** A text input field containing the value "123".
- Local password:** A text input field containing the value "jack".
- Always use encrypted password?:** A checkbox that is currently unchecked.
- Always authenticate remote?:** A checkbox that is currently unchecked.
- Remote username:** An empty text input field.
- Remote password:** An empty text input field.

At the bottom of the form, there is another set of navigation tabs: "Profile", "Connection", "IP", "RIP", "Authentication", "Callback", and "FINISH".

4. Specify the 'Local username' and 'Local password' this profile will send to the remote site during the authentication process. For example, the ISP profile uses these values to log on to your ISP account. This information was filled in when you completed the Internet Wizard.

Note: Local username and Local password are case-sensitive.

5. Specify the type of password the Diva LAN ISDN Modem will send to the remote: encrypted or any (unchecked). If the remote is not using the same type of encryption, the call will be rejected.

Note: This setting applies to outgoing calls only.

6. Enable 'Always authenticate the remote' if you want the Diva LAN ISDN Modem to ask the remote to identify itself with a username and password. The Diva LAN ISDN Modem will compare the values the remote sends against the settings you make for 'Remote username and Remote password'. Remote username and Remote password are case-sensitive.

Note: This setting applies to outgoing calls only. The Diva LAN ISDN Modem always authenticates the remote when receiving an incoming call.

7. Click 'Finish', then 'Save', then 'Reset'.

Callback

Callback is another effective method to control access to the Diva LAN ISDN Modem. When callback is enabled, the Diva LAN ISDN Modem functions as a callback client, and the remote site being called functions as a callback server.

The client calls the server, hangs up, then waits for the server to call back to establish the connection.

The client calls the server, the connection is dropped or disconnected, then waits for the server to call back to re-establish the connection. While waiting for the server to call back, the Diva LAN ISDN Modem may accept incoming calls that are not from the server. To ensure that only calls from the server are accepted you can use call authentication (set the *always authenticate remote* option as shown on page 126) to validate the incoming call.

Note: *When you enable callback using the web configuration interface, the Diva LAN ISDN Modem automatically enables support for incoming data calls (page 121).*

Callback modes

Two callback modes are available. Each provides different features. For callback to work, both client and server must use the same mode.

Callback control protocol	This is a Microsoft-developed solution. It is used by NT4, and devices from Cisco, Ascend, and other vendors. NCP enables you to specify a time delay before the server calls back, and supports both the user specified and administrator specified options.
ISDN callback	Unlike the callback control protocol, the server does not answer the initial call from the Diva LAN ISDN Modem when using ISDN callback mode. Therefore, there is no charge for the call. This can be advantageous if you are making a lot of calls without a flat-rate package, or are making long distance calls. ISDN modem only works with Cisco IOS. It uses caller ID information to return the call. Therefore, caller ID must be enable on your line to use this mode.

Callback options

Two callback options are available: user specified and administrator specified.

User specified	This option requires that the Diva LAN ISDN Modem supply the server with the callback number to use. If the server is on a PBX, or must dial long distance, you may need to include appropriate dialing prefixes. Contact the system administrator of the server to determine the exact requirements. The main advantage of this option is that if you change the Diva LAN ISDN Modem's ISDN phone numbers, you do not have to inform the server, since you supply the phone number with each call.
Administrator specified	With this option, the Diva LAN ISDN Modem does not supply the server with a number to dial. Instead, the remote identifies the Diva LAN ISDN Modem by its caller ID or information supplied during call authentication. The server then consults a pre-configured table to determine the number to dial. The main advantage of this option is centralized security. The server maintains a list of all valid clients, with their physical phone numbers and security information.

Delay before host calls back

This option is only supported by the callback control protocol. It allows you to specify the amount of time the server waits before calling back. The Diva LAN ISDN Modem proposes the delay during callback negotiation. The server can either accept or reject it.

Timeout waiting for callback

Sets the amount of time the Diva LAN ISDN Modem waits for the server to call back. During this time, the Diva LAN ISDN Modem may accept calls that are not from the callback server unless you use call authentication (set the *always authenticate remote* option as shown on page 126) to validate the incoming call.

Note: 'Incoming Data Calls' automatically enabled

When you enable callback using the web configuration interface, the Diva LAN ISDN Modem automatically enables support for incoming data calls (see [Incoming data calls](#) on page 121).

Setting up callback

1. On the Configuration main menu, click 'Connection Profiles'.
2. Click 'Edit' for the profile you want to configure callback for.
3. Click 'Callback' on the menu bar. You will see the following page.

The screenshot shows a window titled 'Connection Profiles' with a help icon in the top right corner. Below the title bar is a tabbed interface with the following tabs: Profile, Connection, IP, RIP, Authentication, Callback, and FINISH. The 'Callback' tab is currently selected. The main area of the window contains the following configuration options:

- Callback type:** A dropdown menu with 'None' selected.
- Callback option:** A dropdown menu with 'No callback' selected.
- Callback numbers:** Two input fields, both containing 'Not required'.
- Delay before host calls back:** An input field with '5' and the unit 'seconds'.
- Timeout waiting for callback:** An input field with '30' and the unit 'seconds'.

At the bottom of the window, there is a navigation bar with the same tabs as the top: Profile, Connection, IP, RIP, Authentication, Callback, and FINISH.

4. Configure the callback parameters as required by your setup.
5. Click 'Finish', then 'Save', then 'Reset'.

Manual Dialing

The Diva LAN ISDN Modem automatically establishes the ISDN link whenever it senses outgoing data traffic (such as for your Internet connection). However, there may be certain situations when this is not desirable. The manual dialing option gives you this control.

Each profile can be configured to use manual dialing. If you enable this option and password protect the Diva LAN ISDN Modem, you effectively put ISDN access under direct manual control of authorized users.

Enabling Manual Dialing

1. From the web configuration menu, click 'Connection Profiles'.
2. Click the 'Edit' button next to the profile you want to configure.
3. Click 'Connection' on the menu bar. You will see the following page:

Connection profiles

Connection parameters

Profile | **Connection** | IP | RIP | Authentication | Callback | FINISH

Telephone number 1:

Telephone number 2:

Backup telephone number 1:

Backup telephone number 2:

ISDN call type:

Compression? ☐

Manual dialing only? ☐ ← *'Manual Dialing Only' option*

Idle timer: seconds

Max retries:

Retrv delay: seconds

4. Check the 'Manual dialing only' box.
5. Click 'Finish', then 'Save', then 'Reset'.

Custom Security Features

By using IP filters you can create your own custom security solutions. For example, you can:

- limit local access to the Diva LAN ISDN Modem for certain computers
- accept incoming traffic only from certain remote users or networks
- drop incoming or outgoing nuisance traffic

For more information, see [IP Filters](#) on page 155.

Advanced Topics

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Overview

This chapter describes advanced settings and provides background information on advanced configuration issues such as connection retries, IP filtering, and IP routing.

Connection Retries

The connection retry parameter controls how many times the Diva LAN ISDN Modem attempts to establish a connection using a specific profile. If the profile cannot be connected using either its primary telephone number or backup telephone number, it is disabled.

Once a profile has been disabled, it must be re-enabled before it can be used again. There are three ways to re-enable a profile:

- Manually dial the profile (see [Dialing Out](#) on page 45).
- Reset the Diva LAN ISDN Modem (see [Resetting the Device](#) on page 50).
- Set the profile to be re-enabled automatically by defining a value for the 'Profile restore delay' parameter (see [Defining a Profile Restore Delay](#) on page 134).

Defining Retry Settings

1. From the web configuration menu, click 'Connection Profiles', then click 'Edit' for the profile you want to configure.
2. Click 'Connection' on the menu bar. You will see the following page.

Connection profiles

Connection parameters

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Telephone number 1:

Telephone number 2:

Backup telephone number 1:

Backup telephone number 2:

ISDN call type:

Compression? ☐

Manual dialing only? ☐

Idle timer: seconds

Max retries:

Retry delay: seconds

'Max Retry' and 'Retry Delay' settings

3. Set 'Max retries' to the number of times you want to dial when trying to connect. Dialing attempts alternate between Telephone number 1/2 and Backup Telephone number 1/2.
4. Set 'Retry delay' to the number of seconds the Diva LAN ISDN Modem should pause between dialing attempts.
5. Click 'Finish', 'Save', then 'Reset'.

Defining a Profile Restore Delay

1. From the web configuration menu, click 'Connection Profiles', then click 'Edit' for the profile you want to configure. You will see the following page.

Connection profiles

Profile

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Profile name:

Enable profile? ☒

Protocol: More...

Backup profile:

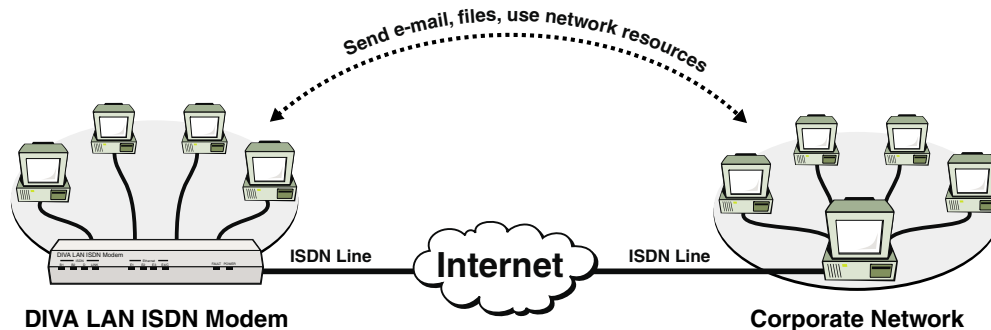
Profile restore delay: seconds

'Profile restore delay'

2. Set 'Profile restore delay'. This value must be greater than 0 if you want to use a backup profile.
3. Click 'Finish', 'Save', then 'Reset'.

Creating a Virtual Private Network

A virtual private network (VPN) is an interconnection between two networks that uses the PPTP (point-to-point tunneling protocol) over the Internet. By using the Internet to transport data, a VPN can eliminate long distance charges associated with traditional dial-up solutions. Since PPTP provides a secure connection, network security is not compromised.



Pre-requisites

VPN adapter software must be present on each system that makes a VPN connection.

If you are using Windows 95, Dial-Up Networking 1.3 (available from Microsoft's web site at <http://www.microsoft.com>) is required to create a VPN. Do not install DUN 1.3 on Windows 98, as a VPN adapter is included with these operating systems. However, the VPN adapter may not have been installed when Windows 98 was first installed on your system. See [Installing the VPN Adapter in Windows 95 and Windows 98](#) on page 140 for more information. Windows 2000 includes a VPN Adapter.

If you are using an operating system other than Windows, you must acquire and install third-party VPN adapter software.

Before Starting

Before starting, create a connection to the Internet as described in [Setup](#) on page 15. Make sure your Internet access is working properly by visiting a web site such as <http://www.eicon.com/>. Also, contact your network administrator and obtain the IP address or host name of the VPN server as well as the user name and password for each user that will be connected to the VPN.

The procedure for adding a VPN adapter in Windows 2000 is different from that of Windows 95 and Windows 98.

- [Creating a VPN with Windows 95 or Windows 98](#) 137
- [Creating a VPN with Windows 2000](#) 138
- [Connecting to the VPN](#) 140
- [Installing the VPN Adapter in Windows 95 and Windows 98](#) 140

Creating a VPN with Windows 95 or Windows 98

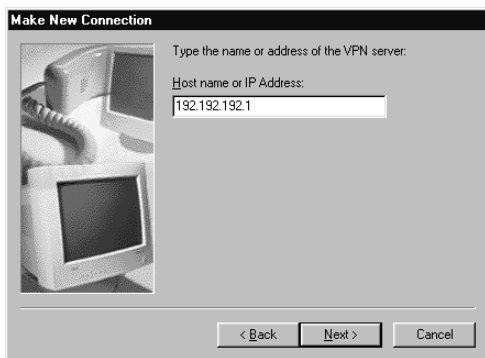
1. Create a new connection. To do this, double-click 'My Computer', double-click 'Dial-Up Networking', then double-click 'Make New Connection'. You will see the following dialog.



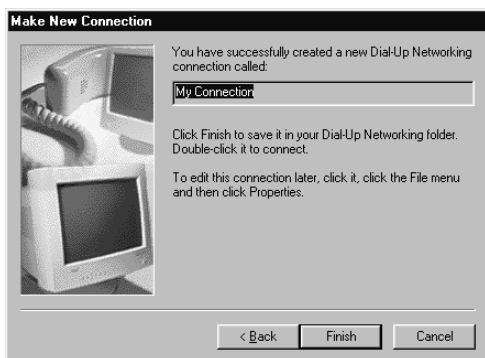
2. Enter a name for your connection.
3. Select 'Microsoft VPN Adapter' as the device.

Note: If you do not see 'Microsoft VPN Adapter' as an option, make sure the VPN adapter is installed on your system. See [Installing the VPN Adapter in Windows 95 and Windows 98](#) on page 140 for more information.

4. Click 'Next'. You will see the following dialog box. Enter the IP address or host name of the VPN server.



5. Click 'Next'. You will see the following dialog box.



6. Click 'Finish' to create the new connection.

Creating a VPN with Windows 2000

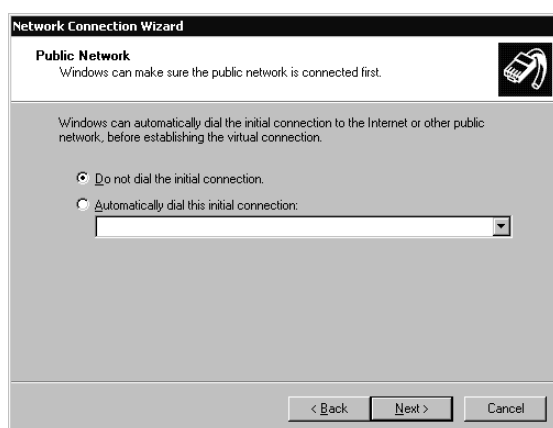
1. Click 'Start', point to 'Settings', 'Network and Dial-up Connections', and then double-click 'Make New Connection'.



2. The Network Connection Wizard opens. Click 'Next'.
3. Select 'Connect to a private network through the Internet' as your 'Network Connection' type and click 'Next'.



4. Select 'Do not dial the initial connection', then click 'Next'.



5. Enter the host name or IP address of the VPN Server, and then click 'Next'.

The screenshot shows the 'Destination Address' step of the Network Connection Wizard. The title bar reads 'Network Connection Wizard'. Below the title, the section is 'Destination Address' with the instruction 'What is the name or address of the destination?'. A text box contains '192.168.1.1'. At the bottom are buttons for '< Back', 'Next >', and 'Cancel'.

6. The Connection Availability screen opens. Select 'Only for myself' and click 'Next'.

The screenshot shows the 'Connection Availability' step of the Network Connection Wizard. The title bar reads 'Network Connection Wizard'. Below the title, the section is 'Connection Availability' with the instruction 'You may make the new connection available to all users, or just yourself.' Two radio buttons are present: 'For all users' (selected) and 'Only for myself'. At the bottom are buttons for '< Back', 'Next >', and 'Cancel'.

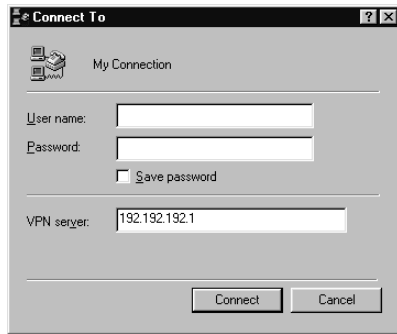
7. The 'Completing the Network Connection Wizard' window opens. Enter a name for the connection, then click 'Finish'.

The screenshot shows the 'Completing the Network Connection Wizard' step. The title bar reads 'Network Connection Wizard'. The main title is 'Completing the Network Connection Wizard'. A text box contains 'Virtual Private Connection'. Below it, instructions are provided: 'To create this connection and save it in the Network and Dial-up Connections folder, click Finish.' and 'To edit this connection in the Network and Dial-up Connections folder, select it, click File, and then click Properties.' There is a checkbox 'Add a shortcut to my desktop' which is unchecked. At the bottom are buttons for '< Back', 'Finish', and 'Cancel'.

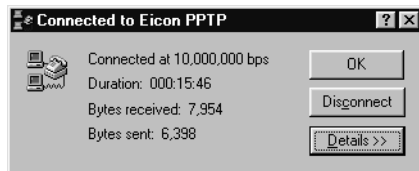
Note: Once a VPN connection profile is created, you may copy and paste the profile in the 'Network and Dial-up Connections' folder. You can then rename and modify the VPN connections.

Connecting to the VPN

1. To connect to the VPN, launch the connection you just created with Dial-Up Networking. You will see the following dialog box.



2. Enter your user name and password, then click 'Connect'. The Diva LAN ISDN Modem will automatically establish the link to the Internet and you will see the following dialog box, showing the details of your connection.



The bps value reported by this dialog box is your LAN Ethernet speed. Your actual connection speed will be either 64 bps or 128 kbps depending on how many B-channels you are using.

Note: The idle timer on the Diva LAN ISDN Modem cannot be used to manage VPN connections. Therefore, if your VPN connection remains idle for long periods of time, the link will not be disconnected unless you manually disconnect.

Installing the VPN Adapter in Windows 95 and Windows 98

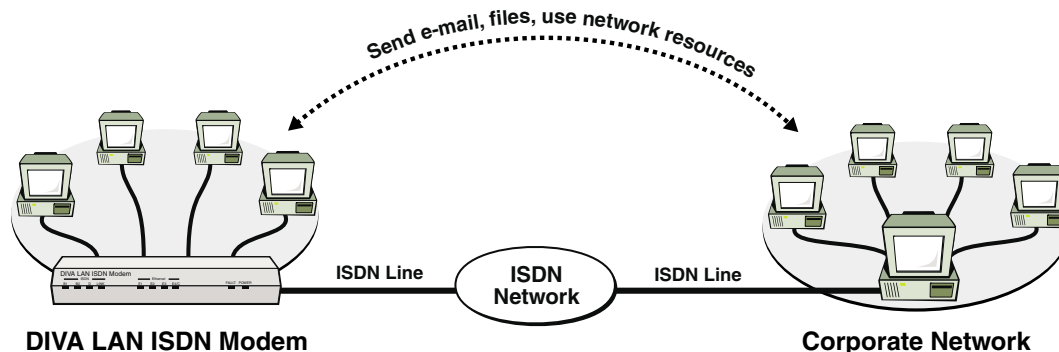
For the VPN Adapter to be available for Dial-up Networking, the VPN Adapter must be installed in the Network Control Panel. The installation procedure depends on your operating system. To see if you already have VPN installed, click 'Start', 'Settings', 'Control Panel', then double-click 'Network'. The entry 'Microsoft Virtual Private Networking Adapter' should be among the list of components installed. If not, follow one of the procedures below.

Note: The Windows 95 CD-ROM does not include a VPN Adapter. You must download Dial-Up Networking 1.3 from Microsoft's web site at <http://www.microsoft.com>, then you must install the VPN Adapter as described below. The Windows 98 CD-ROM includes a VPN Adapter. Do not install Dial-Up Networking 1.3 in Windows 98.

1. Click 'Start', 'Settings', 'Control Panel', then double-click 'Network'.
2. Click 'Add', select 'Adapter', then click 'Add'.
3. From the 'Manufacturers' list, select 'Microsoft'. From the 'Network Adapters' list, select 'Microsoft Virtual Private Networking Adapter'.
4. Click 'OK', then 'OK'. You may be asked to insert your Windows CD-ROM.
5. You must restart your computer once installation is complete.

Setting up a Corporate Profile

This option enables you to connect one or more computers to your corporate LAN for intranet web browsing, e-mail, and file transfer. Generally, this type of connection takes place via a direct, dial-up ISDN link with the corporate LAN. For example:



Note: The Diva LAN ISDN Modem cannot be used on both sides when connecting to a corporate network. The corporate network must have its own gateway.

Step 1: Gather information

Contact your corporate network administrator and record the following information:

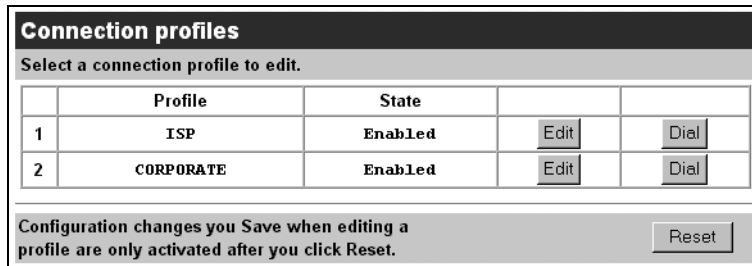
ISDN number(s) of corporate network	This is the phone number the Diva LAN ISDN Modem will dial to access the corporate network. A backup number may also exist in case the primary number is busy or unavailable.
User name	Name the Diva LAN ISDN Modem will use to log on to the corporate network. If your corporate network is an NT network, you may need to specify a domain name and user name pair. For example: HEADOFFICE\bob.
Password	Password the Diva LAN ISDN Modem will use to log on to the corporate network.
Domain name of the corporate network	This is the domain name that identifies the network. For example: eicon.com
Primary and Secondary DNS server addresses	To reach other computers on the corporate network you need to use the network's DNS servers.
IP address and Subnet mask of corporate network	This is only required if you intend to connect to the Internet at the same time as your corporate network.
Static IP address Subnet mask	On some corporate networks, the network administrator will assign a static IP address and subnet mask to the Diva LAN ISDN Modem. If not, the Diva LAN ISDN Modem will negotiate its own address and subnet mask when it connects to the network.

Note: Addresses are written as four numbers separated by periods. Each number can range from 0 to 255. For example: 213.132.21.1

Step 2: Configure the Corporate profile

Use the Corporate profile to define the configurations settings for the connection to your corporate network.

1. Start the web-based configuration interface and log in.
2. Click 'Connection profiles'.



Connection profiles

Select a connection profile to edit.

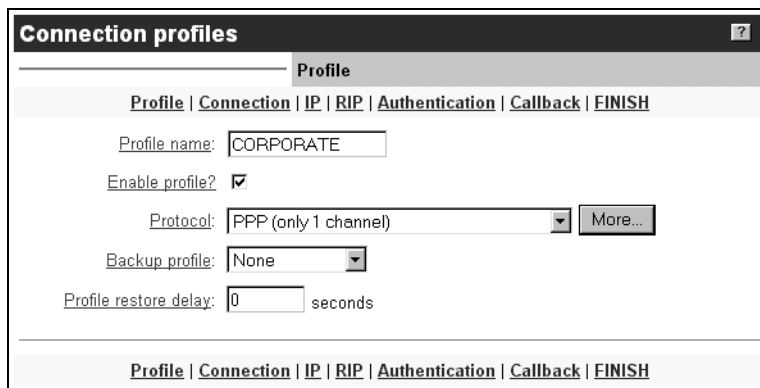
	Profile	State		
1	ISP	Enabled	Edit	Dial
2	CORPORATE	Enabled	Edit	Dial

Configuration changes you Save when editing a profile are only activated after you click Reset.

Reset

Note: If this is the first time you are using the web-based configuration interface, the 'Connection profiles' option will not be available. This link is only active once you have completed the Internet Wizard. At this point, you should run the Internet Wizard as described and enter dummy values in all fields. Once the Diva LAN ISDN Modem resets you will be able to access the Connection profiles option.

3. Click 'Edit' for the CORPORATE profile.



Connection profiles

Profile

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Profile name: CORPORATE

Enable profile? ☒

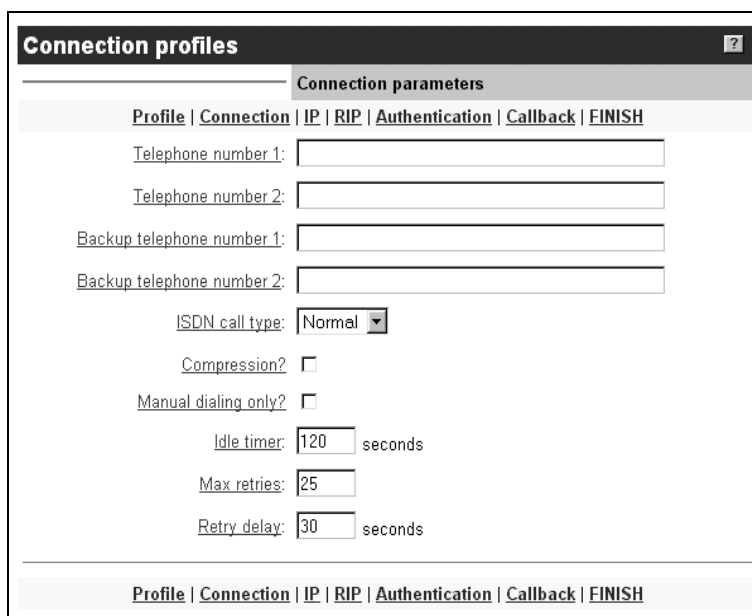
Protocol: PPP (only 1 channel) More...

Backup profile: None

Profile restore delay: 0 seconds

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

4. Select a protocol for the connection to the corporate network. See [Selecting a Connection Protocol](#) on page 65 for information on available protocols.
5. Click 'Connection' on the menu bar.



Connection profiles

Connection parameters

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

Telephone number 1:

Telephone number 2:

Backup telephone number 1:

Backup telephone number 2:

ISDN call type: Normal

Compression? ☐

Manual dialing only? ☐

Idle timer: 120 seconds

Max retries: 25

Retry delay: 30 seconds

Profile | Connection | IP | RIP | Authentication | Callback | FINISH

6. Set the following parameters:
 - **Telephone number 1:** Specify the ISDN phone number of the corporate network.
 - **Backup telephone number 1:** Specify the backup number to dial when *Telephone number 1* is busy or not available. If the corporate network does not have a backup number, leave this field blank.
7. Click 'IP' on the menu bar.

The screenshot shows the 'Connection Profiles' window with the 'IP options' tab selected. The window has a title bar with a question mark icon. Below the title bar is a menu bar with options: Profile, Connection, IP, RIP, Authentication, Callback, and FINISH. The 'IP' option is currently selected. The main area contains several input fields: 'Select profile mode' (a dropdown menu showing 'NAT (Network Address Translation)'), 'Primary DNS address' (0.0.0.0), 'Secondary DNS address' (0.0.0.0), 'Domain name' (empty), 'IP address' (0.0.0.0), 'Subnet mask' (0.0.0.0), and 'Remote IP address' (0.0.0.0). At the bottom, there is another menu bar with the same options as the top one.

8. Set the following parameters:
 - **Select profile mode:** Leave this set to NAT unless you have a specific requirement not too. For more information on NAT, see [Network Address Translation \(NAT\)](#) on page 116.
 - **Primary/Secondary DNS address:** Specify the addresses of the primary/secondary DNS servers on the corporate network. If you leave these addresses set to 0.0.0.0, the Diva LAN ISDN Modem will attempt to retrieve the DNS addresses for you when it connects to the corporate LAN (if supported by the corporate LAN).
 - **Domain name:** Specify the DNS name of the corporate network. For example: eicon.com.
 - **IP address:** On some corporate networks, the network administrator will assign a static IP address to the Diva LAN ISDN Modem. If this is your case, enter the static IP address here. Leave this set to 0.0.0.0 if you want the Diva LAN ISDN Modem to negotiate its own address when it connects to the network.
 - **Subnet mask:** Specify the subnet mask associated with the *IP address*.
 - **Remote IP address:** In some instances, you need to specify the IP address of the corporate network.
9. Click 'Authentication' on the menu bar.

The screenshot shows the 'Connection profiles' window with the 'Authentication parameters' tab selected. The window has a title bar with a question mark icon. Below the title bar is a menu bar with options: Profile, Connection, IP, RIP, Authentication, Callback, and FINISH. The 'Authentication' option is currently selected. The main area contains several input fields: 'Local username' (123), 'Local password' (masked with asterisks), 'Always use encrypted password?' (checkbox), 'Always authenticate remote?' (checkbox), 'Remote username' (empty), and 'Remote password' (empty). At the bottom, there is another menu bar with the same options as the top one.

10. Set the following parameters:
 - **Local username:** Specify the name the Diva LAN ISDN Modem will use to log on to the corporate network. If your corporate network is an NT network, you may need to specify a domain name and user name pair. For example: HEADOFFICE\bob.
 - **Local password:** Specify the password the Diva LAN ISDN Modem will use to log on to the corporate network.
 - **Always use encrypted password:** If your corporate network requires encrypted passwords (CHAP or MS-CHAP), enable this option.
11. Click 'Finish', then 'Save'.

Step 3: Configuring Routes (if required)

1. Click 'Manual Config' on the menu bar.
2. Click 'IP'.
3. Click 'Routes'. The Diva LAN ISDN Modem displays the Routes page. Edit the fields (if required) so that they are set as follows:

Rte	Network address	Mask length	Gateway address	Interface	Metric
1	0.0.0.0	0 bits	0.0.0.0	CORPORATE	1
2		bits		None	
3		bits		None	
4		bits		None	
5		bits		None	
6		bits		None	
7		bits		None	
8		bits		None	
9		bits		None	
10		bits		None	

You may enter a maximum of 50 routes.
If all the above entries are full, click Save and more entries will appear.

4. Click 'Save', then 'Reset'.

Your corporate connection is now ready to use. You should be able to send and receive e-mail, share files, or browse any intranet web pages.

Using the corporate connection

The Diva LAN ISDN Modem automatically dials out and establishes the ISDN link to your corporate network as required. You simply launch the applications you use to do your work, such as a web browser or e-mail program, and you are automatically connected.

You can also establish your connections manually, dialing and hanging up connections as you see fit. See [Dialing Out](#) on page 45 for details.

How long will the line stay connected?

By default, the Diva LAN ISDN Modem will stay connected until the line has been idle for two minutes. To adjust this setting, see [Cost Control](#) on page 68.

Support for Microsoft Network Neighborhood

If you are connecting to an Microsoft NT network, see [Spoofing NetBIOS services](#) on page 74 for information on supporting Network Neighborhood functions.

NetBIOS name resolution

If you use Microsoft networking, then you will need to be able to resolve NetBIOS names to IP addresses. If you allow the Microsoft WINS client to use DNS as a method of resolving names (Windows NT), then it could result in persistent ISDN calls being generated. In general, it is recommended that you make entries in the LMHOSTS file of each computer connected to the Diva LAN ISDN Modem to resolve NetBIOS names. Consult the Microsoft documentation for your operating system for more information on how to do this.

Timeouts

To save communications charges, the Diva LAN ISDN Modem will drop the ISDN line when it is idle. Although this may not cause problems for most applications, it can cause difficulties for the corporate server you are connected to.

If the server implements TCP *keep alives*, then the server will hang up your TCP/IP session if the ISDN line is down when the *keep alives* are sent. Thus, when the Diva LAN ISDN Modem reconnects (i.e., the client sends more data), the session will have been aborted.

Dynamic IP addressing

If the corporate network uses dynamic IP address assignment, it is possible that each time the Diva LAN ISDN Modem connects it will be given a different IP address. This can cause problems for some session-based applications when the Diva LAN ISDN Modem drops the ISDN link due to inactivity. When the link is re-established, the server has given the Diva LAN ISDN Modem a new IP address. When the application attempts to continue using the previous session, it is refused because of the address change.

Although applications may not themselves timeout when the Diva LAN ISDN Modem drops the line due to inactivity, the IP stack on the corporate server you are connected to may.

Concurrent Internet and Intranet connections

The Diva LAN ISDN Modem can support both an Internet connection and an intranet connection to your corporate network. This section explains how to install and configure such a setup.

Selecting a connections protocol

One of the primary considerations is choice of connection protocol. If you want to have both connections active at the same time, you must assign PPP to each connection. The reason for this is that any MLPPP-related protocol reserves both ISDN channels for its exclusive use, even if they are not active. Therefore, the only way to share the two ISDN channels between two data connections is to use PPP for each.

Defining routes

If you have two active connections, it is important to define routes so that the Diva LAN ISDN Modem can send data to the proper connection. In most cases, you will want to send certain specific traffic to your corporate network, and route all other traffic to the Internet.

For a complete discussion of routing issues, see [IP Routes](#) on page 147.

Installation and configuration procedure

1. Use the Internet Wizard to define your Internet connection.
2. The Internet wizard will automatically add a default route to the routing table. The default route is defined as 0.0.0.0 with a mask of 0. This is a catch-all route. Any traffic which does not match any other route, will match the default route, and thus be sent to the Internet.
3. Next, create a connection to your corporate network as described in [Setting up a Corporate Profile](#) on page 141
 - Choose PPP as the connection protocol.
 - When you reach the routing table, you should configure it as outlined in the section [Multiple connections](#) on page 150.
4. You should now be able to use both connections.

IP Routes

This section provides background information on why IP routes are needed and explains how to define them. However, before you can understand routing, you must be familiar with IP addressing and how the Diva LAN ISDN Modem assigns them.

About IP addresses

IP addresses identify the computers (and other devices) on an IP network. Each address is composed of 32 bits. To make things easier to understand, addresses are written out as four decimal numbers separated by dots. The numbers can range in value from 0 to 255. For example: 192.168.1.1 or 222.182.22.39

Using masks

IP addresses are composed of two parts: the network address and the host address. A host is any computer (or other device) on a network that is capable of transmitting or receiving data. To determine which portion of the address identifies the network and which portion identifies a host, a mask is used.

Masks are specified in bits. A logical bitwise AND operation is performed between the address and the mask to extract the network address. To simplify, consider that each of the four decimal numbers that make up an address is represented by 8 bits. This leads to the following network addresses and their corresponding masks:

Mask (# of bits)	Mask (in decimal)	Source IP address	Extracted network address
8	255.0.0.0	222.182.22.39	222.0.0.0
16	255.255.0.0	222.182.22.39	222.182.0.0
24	255.255.255.0	222.182.22.39	222.182.22.0
32	255.255.255.255	222.182.22.39	222.182.22.39

This table also illustrates how the mask is used to extract the network address for a given source address. Note that when the mask is 32 bits, the extracted address is identical to the source address, and refers to a single host computer rather than a network.

Static vs. dynamic addresses

IP addresses can be either dynamic or static. Static addresses are fixed, and must be changed manually. They are used by computers that are permanently connected to the Internet (a web server, for example), and sometimes by computers on a LAN.

Dynamic addresses can change. They are assigned using a special protocol such as DHCP or PPP (IPCP). For example, when connecting to the Internet, the IP address assigned to the Diva LAN ISDN Modem by your ISP is usually dynamic, assigned by PPP (IPCP). It changes each time the Diva LAN ISDN Modem connects.

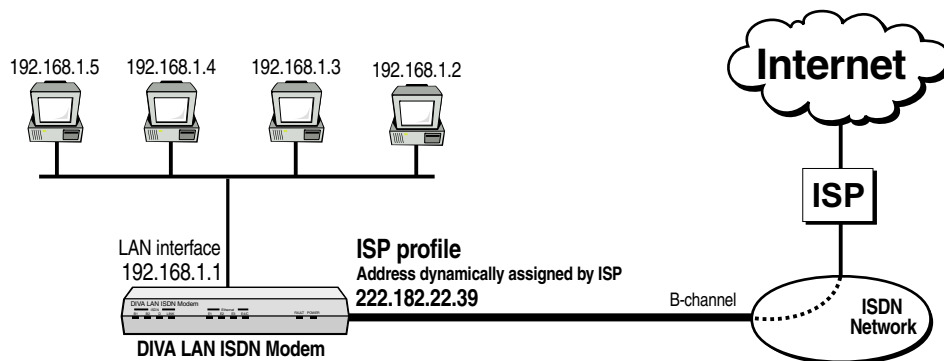
The Diva LAN ISDN Modem and IP addresses

The Diva LAN ISDN Modem can have up to three IP addresses assigned to it. One address is used on its internal LAN. The other two are used to communicate externally with remote sites.

Internal LAN addresses	By default, the Diva LAN ISDN Modem is configured to act as a DHCP server. This means it is responsible for assigning an IP address to the computer connected to it. To receive an address, your computer must be configured to obtain their IP addresses automatically from a DHCP server (see Advanced Topics on page 132).
------------------------	---

External addresses	When the Diva LAN ISDN Modem establishes a connection to a remote site, it needs to be identified with an IP address. This address is associated with the profile making the connection. Since, two profiles are supported, two IP addresses are required. Generally, these external addresses are dynamic, and are automatically negotiated when the Diva LAN ISDN Modem connects with the remote site. For example, when establishing a link with an ISP, the ISP generally assigns an IP address to the Diva LAN ISDN Modem. This address will change each time the Diva LAN ISDN Modem reconnects.
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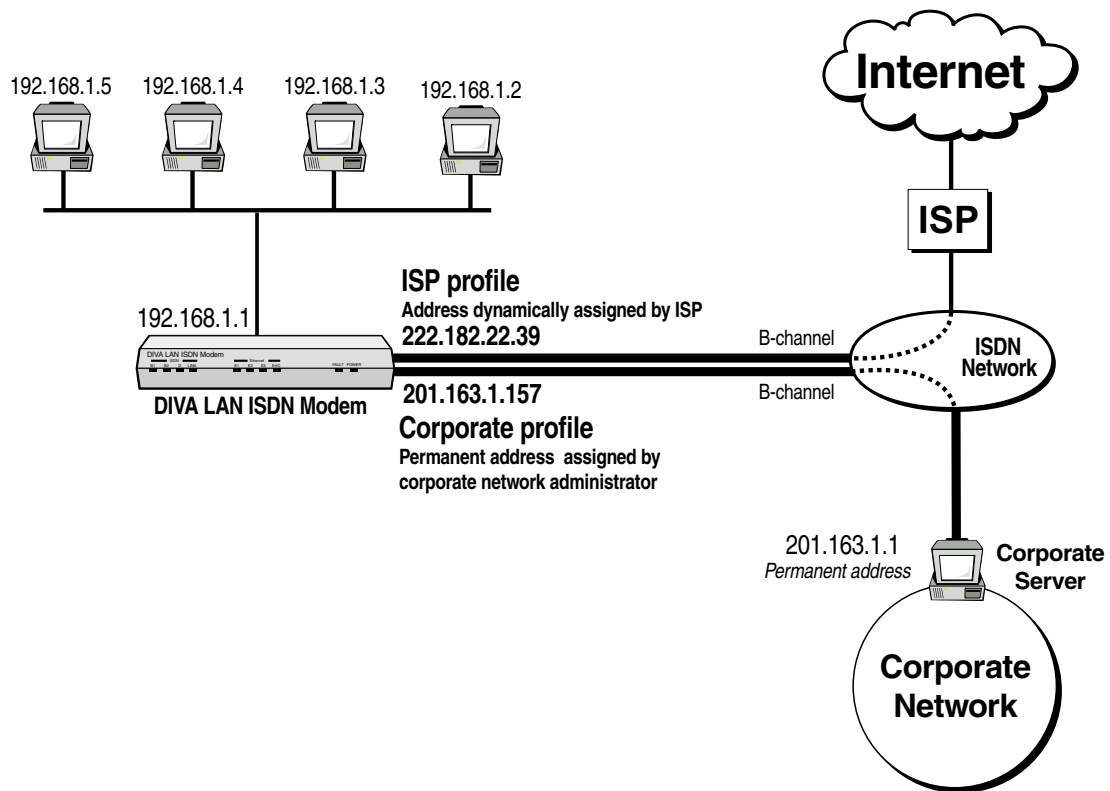
Scenario 1: Diva LAN ISDN Modem Connected Directly to a Computer



In this example, the address 222.182.22.39 is assigned to the Diva LAN ISDN Modem. The address is associated with the ISP profile, since this is the profile that was used to establish the connection. The computer connected to the Diva LAN ISDN Modem is assigned the local address of 192.168.1.2 and gains Internet access through the Diva LAN ISDN Modem.

Scenario 2: Diva LAN ISDN Modem with Static Addresses

In some cases, you may be required to assign a static IP address to a profile. This may occur when connecting to a corporate network. For example:



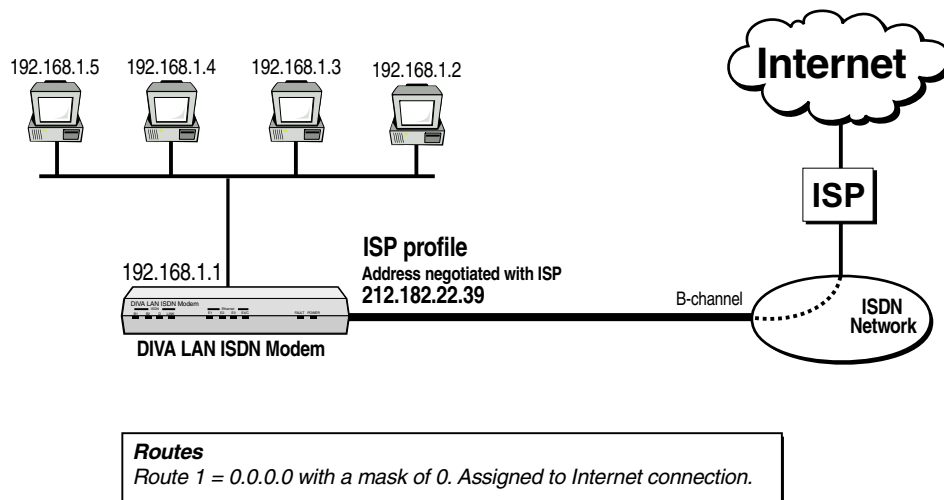
The above example shows three addresses assigned to the Diva LAN ISDN Modem: one for the internal LAN, one for an Internet connection, and one for a connection to a corporate network.

Why routes are needed

Data on an IP network is carried in small packages called datagrams. Each datagram contains the IP address of its source and destination. In order to send datagrams to their proper destination, the Diva LAN ISDN Modem requires a list of destinations and the addresses that are associated with it. This information is stored in a route. Since more than one route is generally required, they are grouped together in a routing table. Each time the Diva LAN ISDN Modem sends or receives a datagram, it consults the routing table to determine the target destination for the datagram.

Single connection

Consider the following scenario:

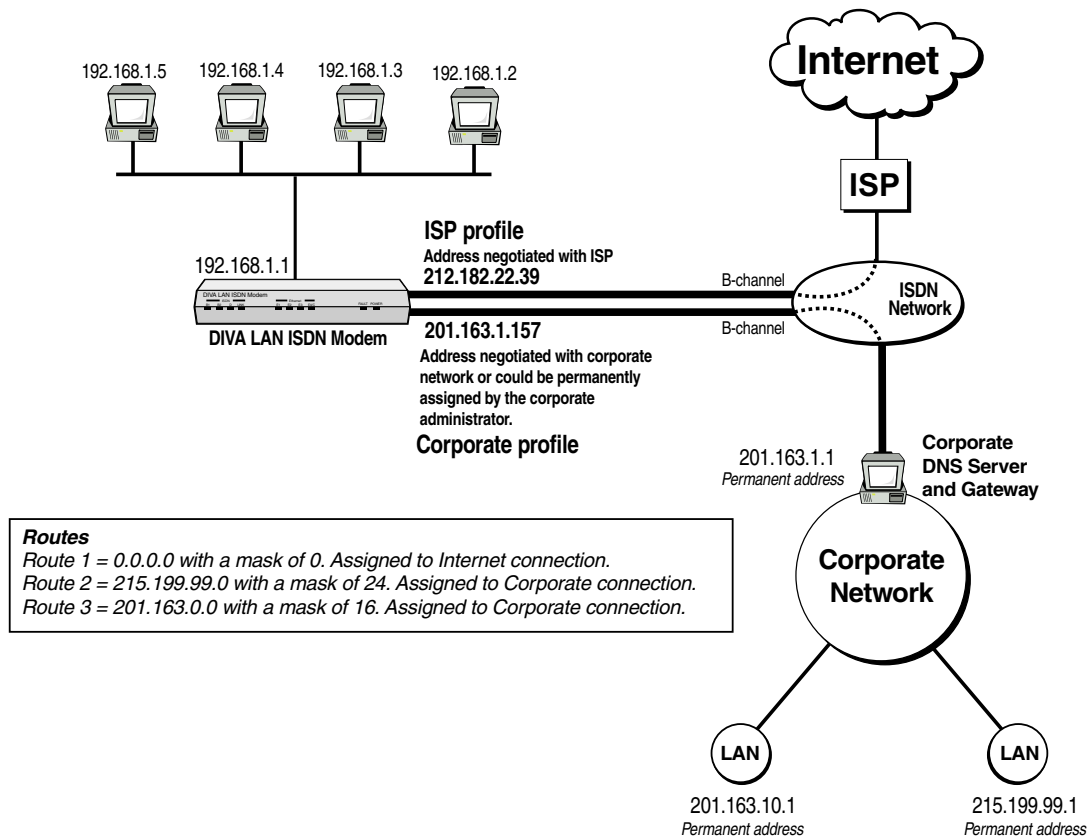


Since there is only one destination for outgoing data (the Internet), only one route is required. This route needs to match all addresses. The special address 0.0.0.0 does this. The same would be true for a Corporate connection. If you want to route all data to the corporate network, specify a single route using the special address 0.0.0.0.

There can be only one default route on the Diva LAN ISDN Modem. The default route always uses the special address 0.0.0.0.

Multiple connections

Consider the following scenario, which features an Internet and Corporate connection, each using one B-channel (PPP):



This scenario requires three routes:

Route 3 is used to route traffic to the Corporate network (201.163.0.0). It is assigned to the Corporate connection.

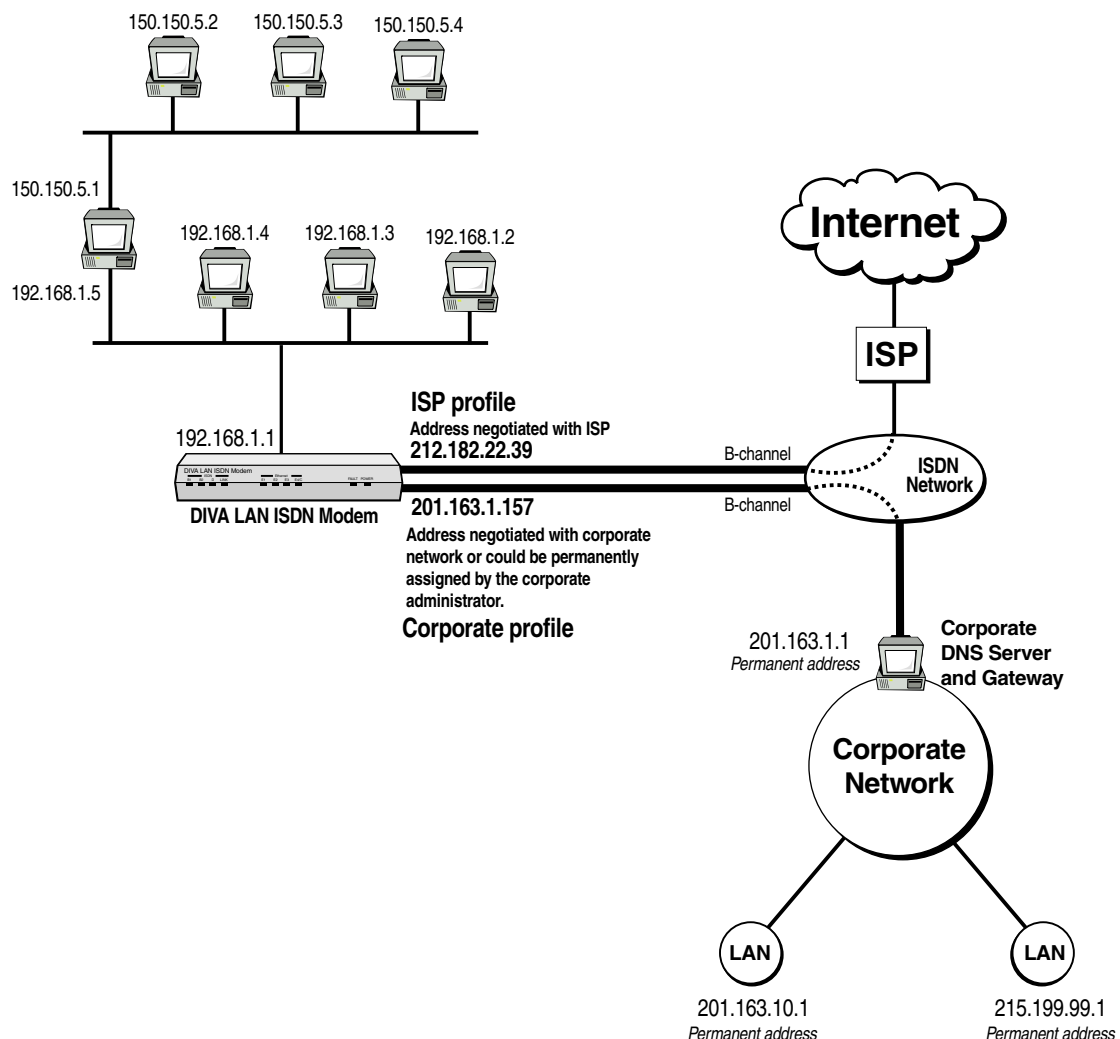
Notice that two subnetworks are directly connected to the Corporate network. Since one of these subnetworks has the same network address (201.163), traffic addressed to users on this subnet will be properly routed.

Route 2 is required to send traffic to the second subnet (215.199.99.1). It is assigned to the Corporate connection.

Route 1 is the default route. It is assigned to the Internet connection. It matches any address. Therefore, any traffic that is not routed by Route 2 or 3 is routed by Route 1 to the Internet.

Routing on the local LAN

The Diva LAN ISDN Modem lets you create your own local area network in conjunction with a hub. In some instances, this network, or the Diva LAN ISDN Modem itself, will be connected to another network via a bridge or router. Consider this scenario, which adds another LAN to the previously discussed example:



Routes

Route 1 = 0.0.0.0 with a mask of 0. Assigned to Internet connection.
Route 2 = 215.199.99.0 with a mask of 24. Assigned to Corporate connection.
Route 3 = 201.163.0.0 with a mask of 16. Assigned to Corporate connection.
Route 4 = 150.150.0.0 with a mask of 16. Assigned to the LAN interface. Gateway address is 192.168.1.5

Assuming that RIP (discussed in the next section), is not being used on the LAN, this scenario requires an additional route.

Route 4 is used to route traffic to the new LAN connected to the computer with address 192.168.1.5. This route is assigned to the LAN interface, which means that instead of traffic being sent onto the ISDN link, it is forwarded onto the LAN. The LAN address of the destination is required, because unlike the ISDN link, where only one device exists at the other end of the connection, more than one device is connected to the LAN. So, the gateway address for this route is 192.168.1.5, which is the computer that provides access to the destination LAN. Of course, this computer must be properly configured to forward the datagrams it receives onto the other LAN.

The Routing Information Protocol (RIP)

RIP permits the Diva LAN ISDN Modem to automatically discover routes for itself, by listening to routing broadcasts from other networks. If your corporate LAN broadcasts RIP updates, the Diva LAN ISDN Modem will be able to discover routes to all subnets connected to it. For example, if a subnet does not have the same network address as your corporate network (as above), you need to create a specific route to support it. However, since RIP is enabled by default, all you need to do is specify a single route to the corporate network. The Diva LAN ISDN Modem will listen for RIP broadcasts and define the needed routes.

Defining routes for the Diva LAN ISDN Modem

You always need to have at least one route. When you use the Internet Wizard, the default route (0.0.0.0) is automatically created for you.

In some cases, it may be necessary to manually add a route, even though RIP is enabled. To edit the routing table, do the following:

1. Start the Web configuration interface and log in.
2. Click 'Manual Configuration'.
3. Click 'IP'.

4. Click 'Routes' to display the following page. If you previously ran the Internet Wizard, the routing table should have at least one entry in it, the default route 0.0.0.0.

Note: Only one default route can be defined for the Diva LAN ISDN Modem, and its network address is always 0.0.0.0. Since the Internet Wizard automatically creates a default route for the ISP profile, you must delete this route if you want to use a default route with the Corporate profile.

IP parameters : Routes

Edit IP routing parameters

Rte	Network address	Mask length	Gateway address	Interface	Metric
1	0.0.0.0	0 bits	0.0.0.0	ISP	1
2		bits		None	
3		bits		None	
4		bits		None	
5		bits		None	
6		bits		None	
7		bits		None	
8		bits		None	
9		bits		None	
10		bits		None	

You may enter a maximum of 50 routes.
If all the above entries are full, click Save and more entries will appear.

Cancel

Reset Form

Back

Next

Save

Use the explanations below to guide you in defining more routes.

- **Network address:** Specifies the IP address of datagrams that should be routed. The address you set here is compared against the destination address in all datagrams that pass through the Diva LAN ISDN Modem. If a match is found, the datagram is routed to the profile specified under Interface.
- **Mask:** Lets you specify the number of bits that are checked when the Diva LAN ISDN Modem compares the address of a datagram to that specified by the Network Address parameter. See [About IP addresses](#) on page 147 for more information.
- **Gateway address:** Not used on the Diva LAN ISDN Modem.
- **Interface:** Choose the name of the profile you want to send the routed data to. The profile you choose should establish a connection to the proper destination so that routing is successful.
- **Metric:** Metric determines the weight of a route. If two identical routes exist, then the Diva LAN ISDN Modem uses the route with the lower metric.

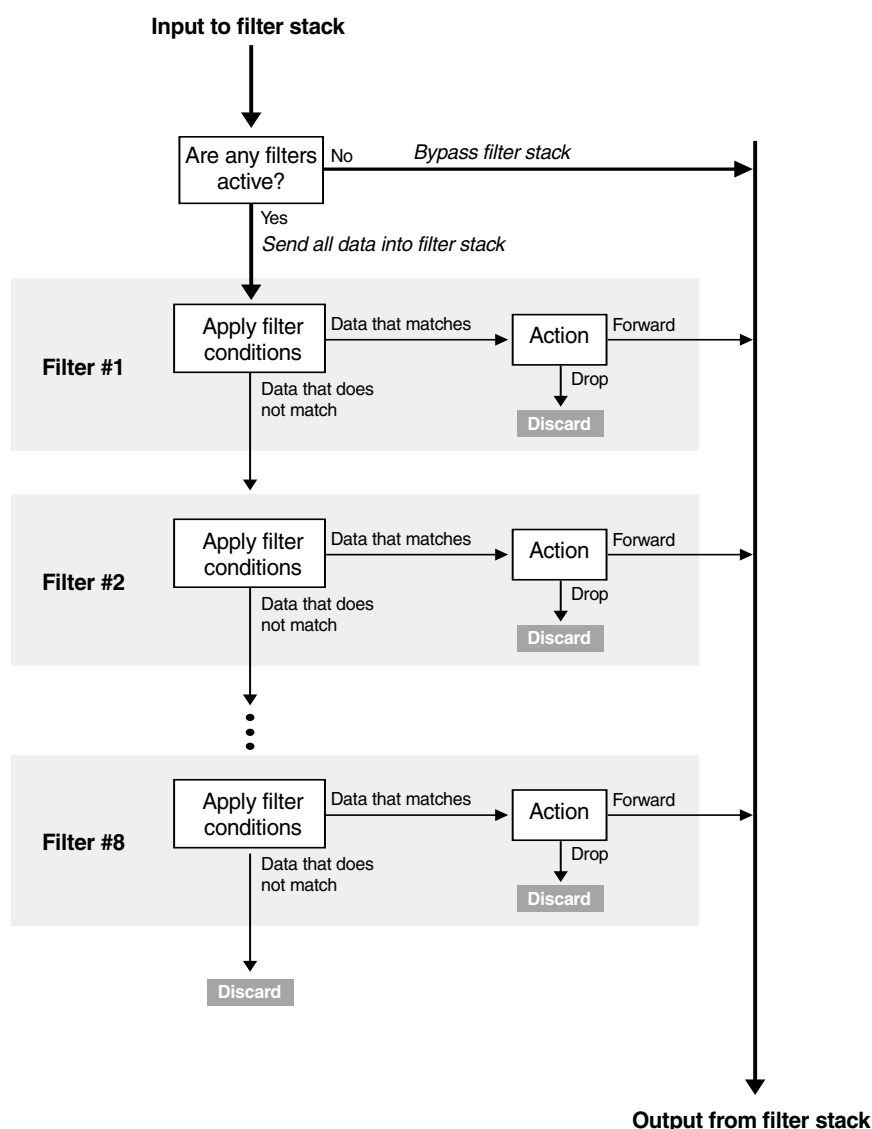
IP Filters

IP filtering provides you with the means to implement customized security, usage, and cost control measures.

- [How Filtering Works](#)..... 155
- [Default filters](#) 156
- [Defining a Filter](#)..... 156
- [IP filtering examples](#) 159

How Filtering Works

Filters are defined in a stack. Up to 8 filters can be combined together to obtain sophisticated results. Data cascades through the filter stack as follows:



Each profile has its own filter stack. **However, note that once any filter is activated, all incoming and outgoing data passes through the filter stack.** By default, the Diva LAN ISDN Modem defines three filters. This means, unless you turn these filters off, all incoming and outgoing data passes through the filter stack.

Default filters

By default, the Diva LAN ISDN Modem defines three editable filters for the ISP profile, plus a fourth filter that cannot be edited:

- Drop incoming datagrams being sent from anywhere that contain the Web (HTTP) protocol
- Drop incoming datagrams being sent from anywhere that contain the Telnet protocol
- Forward all datagrams being sent from anywhere that contain any protocol
- Drop all datagrams being sent from anywhere that contain any protocol

The first two filters prevent outside access to the web-based configuration interface by discarding incoming HTTP and Telnet traffic. When you enable remote management, these filters are deleted.

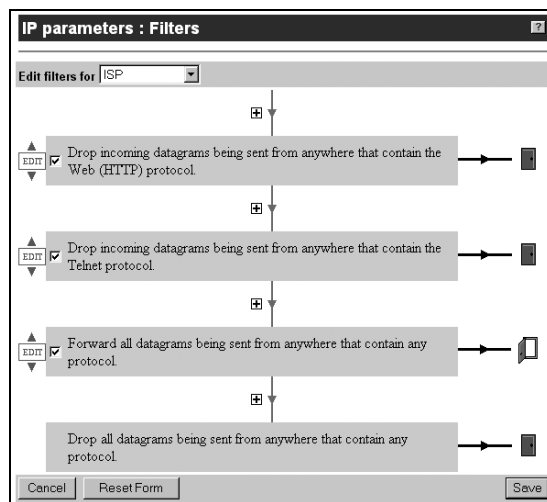
The last filter is required because, by default, any traffic that is not forwarded is discarded when it reaches the bottom of the stack. This filter must be set to operate on all traffic (incoming and outgoing) because, once a filter is activated, all traffic passes through the filter stack.

What is a datagram? Data on an IP network is carried in small packages called datagrams. Along with the data it is carrying, each datagram contains the IP address of its source and destination.

Defining a Filter

Filters become active immediately after they are defined. You do not have to reset the Diva LAN ISDN Modem to activate them. If you are defining a filter that affects your connection to the Diva LAN ISDN Modem, you will lose contact immediately after saving.

1. Start the web configuration interface and log in.
2. Click 'Manual Configuration' then 'IP'.
3. Click 'Filters' to display the following page. (If you enabled remote management you will not see the first two filters.)



- Click a '+' symbol to insert a new filter. The 'Edit Filters' page is shown.

- Define the settings for the filter and click 'Done'. For explanation of the available options, see **'Edit Filters' Page Options** (below).

- Activate the filter by clicking the box that appears to the right of the 'Edit' button.
- Click 'Save'. This makes the filter operational.

Note: Unlike other configurations settings, you do not have to reset the Diva LAN ISDN Modem to make filters operational.

'Edit Filters' Page Options

Action:

- 'Drop': Discard data that matches the filter definition.
- 'Forward': Send data that matches the filter definition to the filter output.

Direction:

- 'incoming': Data being received by the Diva LAN ISDN Modem on the ISDN link.
- 'outgoing': Data being sent by the Diva LAN ISDN Modem on the ISDN link.
- 'all': Both incoming and outgoing.

Source / Destination:

- 'from': Examine the source IP address of the datagram.
- 'to': Examine the destination IP address of the datagram.

Location:

- 'the Ethernet LAN': Sets the filter to match datagrams with network addresses that are the same as that of the Diva LAN ISDN Modem. By default, this is 192.168.1.0. A mask of 255.255.255.0 is used to extract the network address.

- ‘the network’: Sets the filter to match datagrams with network addresses that are the same as that the one you specify. Choosing this option requires that you supply the IP address of a class C network in the next box. The filter uses a mask of 255.255.255.0 to extract the network address (class C network mask).
- ‘host’: Sets the filter to match datagrams with IP addresses that are the same as the one you specify. Choosing this option requires that you supply the IP address of the host computer in the next box. The filter uses a mask of 255.255.255.255.
- ‘anywhere’: Sets the filter to ignore the source and destination address in the datagram.

Address:

- ‘Address’: Only applies if you select *the network* or *the host* for location.

Protocol:

IP datagrams can carry a wide variety of protocol traffic. The Diva LAN ISDN Modem lets you filter the many of the most popular protocols. The following descriptions explain some of the options that are available.

- ‘any’: Applies the filter to any datagram.
- ‘any well known’: Applies the filter to any protocol using TCP or UDP ports in the range 0 to 1023. See RFC 1700 for the complete list of protocols.
- ‘UNIX’: Applies the filter to any protocol using TCP or UDP ports in the range 512 to 1023. See RFC 1700 for the complete list of protocols.
- ‘TCP’: Many protocols (such as HTTP, FTP, Telnet, News) make use of TCP. If you filter all TCP traffic you will prevent the use of these protocols. Note that access to the web configuration interface occurs via HTTP and access to the command line interface occurs via Telnet.
- ‘UDP’: Many protocols (such as SNMP, Time, TFTP, BOOTP) make use of UDP. If you filter all UDP traffic, you will prevent the use of these protocols.
- ‘FTP’: Applies the filter to all datagrams containing the file transfer protocol.
- ‘Web (HTTP)’: If you filter all HTTP traffic, you may not be able to reach the web configuration interface. Filtering outgoing HTTP traffic can be used to prevent users from browsing on the Internet.
- ‘Mail (SMTP)’: Applies the filter to all datagrams containing the mail (SMTP) protocol.
- ‘Mail (POP3)’: Applies the filter to all datagrams containing the mail (POP3) protocol.
- ‘Telnet’: If you filter all Telnet traffic, you will not be able to reach the command line interface.
- ‘TFTP’: The Diva LAN ISDN Modem can function as a TFTP server to support uploading and downloading of configuration files. If you filter TFTP traffic, you will not be able to use this feature.
- ‘DNS’: Domain name system. Filtering DNS datagrams can cause disruptions in the ability to access remote sites.

The following options are also available: NFS/RPC, News, Time (NTP), BOOTP, SNMP, ICMP, Ping (ICMP), Ping Reply, ICMP Redir. For a description of these protocols, consult the appropriate RFC at the site <http://www.faqs.org/>.

IP filtering examples

The examples in this section illustrate how to use filters to:

- Drop incoming traffic from a specific network
- Allow incoming traffic only from a specific network
- Block web surfing

Note: These examples assume that you have not enabled remote management. If enabled, the default filter stack you see will only contain the single filter: 'Forward all datagrams being sent from anywhere that contain any protocol.' If no filters are present, the only visible filter will be "Drop All". The "Forward all" filter is active but invisible.

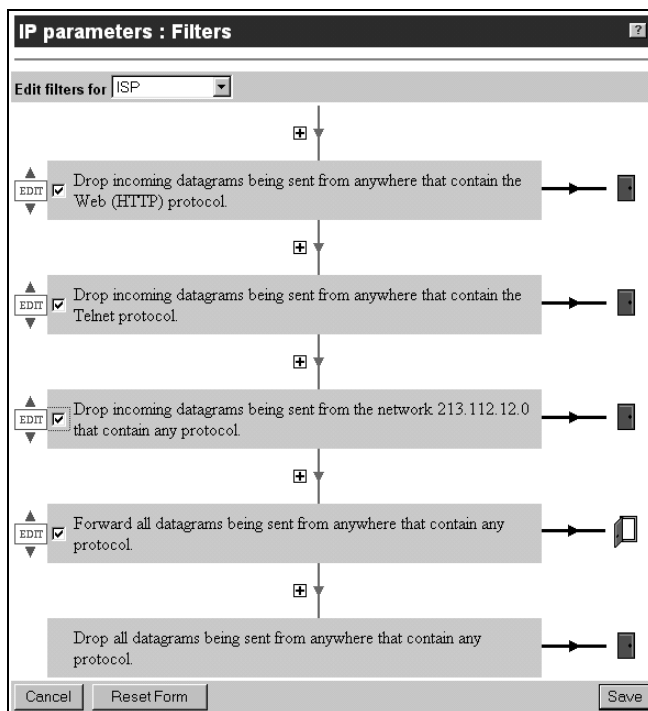
Dropping incoming traffic from a specific network

This example defines a filter to make sure that no traffic is accepted from a specific network. Assume the network has the IP address 213.112.12.0. Since the filter is applied against data from the Internet, it is defined for the ISP profile. Place this filter in the third position in the stack.

Edit IP filters for profile ISP

Drop incoming datagrams being sent from the network: 213.112.12.0 that contain any protocol.

When done, the filter stack should look like this:



Allowing incoming traffic only from a specific network

This example shows how to allow the Diva LAN ISDN Modem to only receive incoming data from a specific network (112.111.212.0) on the Internet. Data from all other networks is dropped. However, outgoing traffic is not affected. This requires defining two filters. Since these filters are applied against data from the Internet, they are defined for the ISP profile.

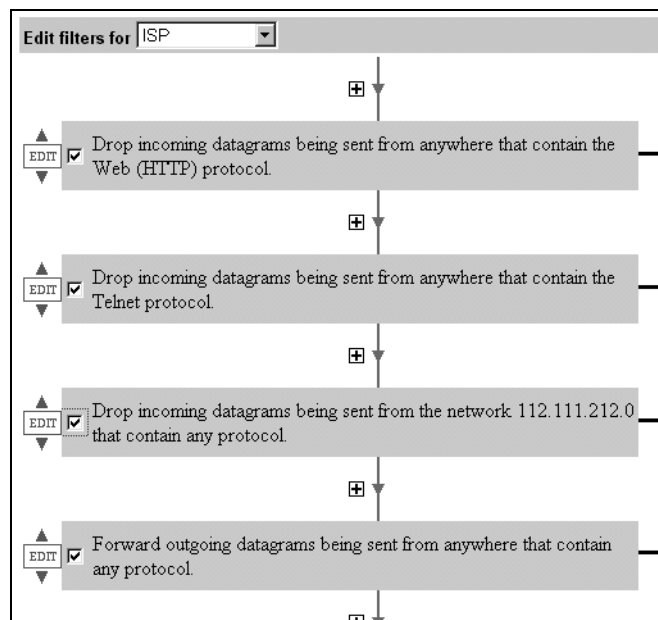
- 1st filter: Define the 1st filter to forward only incoming traffic from 112.111.212.0. Place this filter in the third position in the stack.

Edit IP filters for profile ISP			
Forward	incoming	datagrams being sent	from the network:
112.111.212.0		that contain	any protocol.

- 2nd filter: Define the 2nd filter to forward all outgoing traffic. The easiest way to do this is to edit the existing filter that is set to “Forward all datagrams being sent from anywhere that contain any protocol.” Change it to “Forward *outgoing* datagrams being sent from anywhere that contain any protocol.”

Edit IP filters for profile ISP			
Forward	outgoing	datagrams being sent	from anywhere
		that contain	any protocol.

When done, the filter stack should look like this:



Blocking web surfing

This example shows how to block computers on the local LAN created by the Diva LAN ISDN Modem from surfing the web. Web traffic is carried by the HTTP protocol. Therefore, to stop web access, this protocol needs to be dropped for all outgoing traffic.

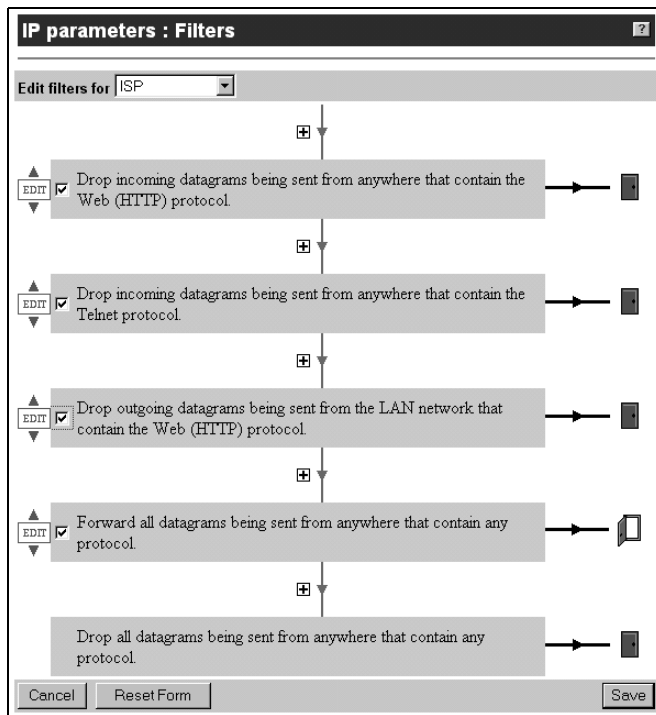
A single filter needs to be defined. Place this filter in the third position in the stack.



Edit IP filters for profile ISP

Drop datagrams being sent from that contain protocol.

When done, the filter stack should look like this:



IP parameters : Filters

Edit filters for

- Drop incoming datagrams being sent from anywhere that contain the Web (HTTP) protocol.
- Drop incoming datagrams being sent from anywhere that contain the Telnet protocol.
- Drop outgoing datagrams being sent from the LAN network that contain the Web (HTTP) protocol.
- Forward all datagrams being sent from anywhere that contain any protocol.
- Drop all datagrams being sent from anywhere that contain any protocol.

Cancel Reset Form Save

V.120 Connection

V.120 was designed to allow non-ISDN devices to communicate with the ISDN network. The Diva LAN ISDN Modem provides support for V.120, so you can connect with such legacy systems. For example, in many countries around the world, Compuserve offers access to their network over ISDN, using the V.120 protocol.

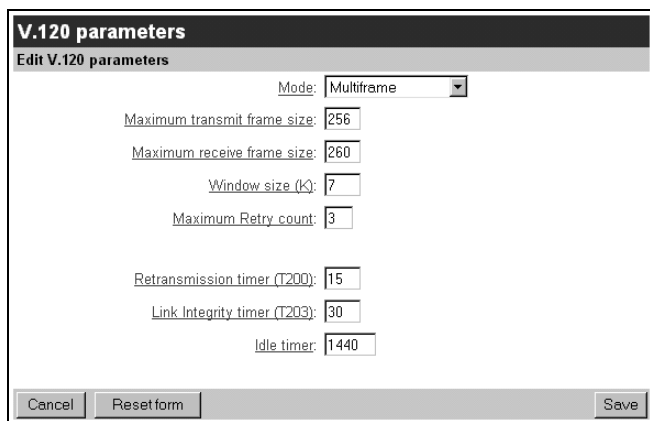
In general, you should use V.120 only when the site you are connecting to requires it. Once the V.120 connection is active, the Diva LAN ISDN Modem automatically establishes a PPP connection on top of it. This is why you will see this option listed as 'PPP over V.120' on the configuration screens.

To make a V.120 connection you must do two things:

- Configure the V.120 protocol for the profile that will make the connection.
- Define a V.120 script to automatically log on to your ISP. The Diva LAN ISDN Modem contains a pre-defined script that should work in the majority of cases. However, you may need to modify this script for your installation.

Configuring the V.120 protocol

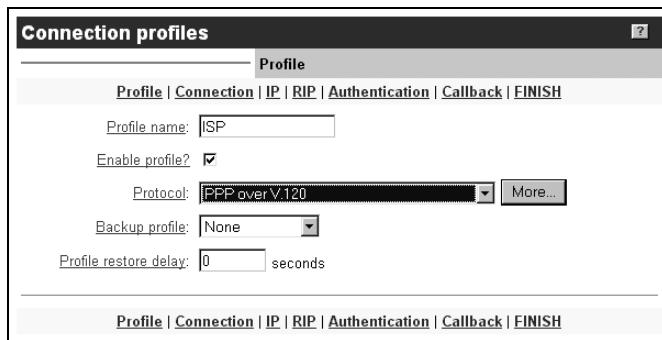
1. From the main menu, click 'Manual Configuration', then 'V.120'. You will see the following page:



The screenshot shows a window titled "V.120 parameters" with a subtitle "Edit V.120 parameters". It contains several input fields for configuring V.120 protocol settings. The "Mode" is set to "Multiframe". Other settings include "Maximum transmit frame size" (256), "Maximum receive frame size" (260), "Window size (K)" (7), "Maximum Retry count" (3), "Retransmission timer (T200)" (15), "Link Integrity timer (T203)" (30), and "Idle timer" (1440). At the bottom, there are "Cancel", "Reset form", and "Save" buttons.

Parameter	Value
Mode	Multiframe
Maximum transmit frame size	256
Maximum receive frame size	260
Window size (K)	7
Maximum Retry count	3
Retransmission timer (T200)	15
Link Integrity timer (T203)	30
Idle timer	1440

2. Define the V.120 parameters to match the settings of the remote site you are going to connect to. For information on each parameter consult the online help by clicking the parameter name.
3. Click 'Save'.
4. On the web configuration menu, click 'Connection Profiles', then click 'Edit' for the profile that will make the V.120 connection.
5. Set the 'Protocol' to 'PPP over V.120'.



The screenshot shows a window titled "Connection profiles" with a subtitle "Profile". It has tabs for "Profile", "Connection", "IP", "RIP", "Authentication", "Callback", and "FINISH". The "Profile" tab is active. It contains fields for "Profile name" (ISP), "Enable profile?" (checked), "Protocol" (PPP over V.120), "Backup profile" (None), and "Profile restore delay" (0 seconds). At the bottom, there are tabs for "Profile", "Connection", "IP", "RIP", "Authentication", "Callback", and "FINISH".

Field	Value
Profile name	ISP
Enable profile?	☒
Protocol	PPP over V.120
Backup profile	None
Profile restore delay	0 seconds

6. Click the 'More' button. You will see the V.120 Dialing Script page:

Connection profiles: V.120 Dialing Script

Editing

Command Value

Select a command

Add/Replace Insert

Resulting Script

Delay 3
Send ""M"
Wait for "Login:&Host Name:"
Case 2
Goto sendhost
Send "cis"
Send ""M"
Wait for "Password:"

Delete Selected
Move Up
Move Down

Cancel Save

7. This page contains a pre-defined script that you can modify for your installation. When the V.120 connection is established, this script is automatically run to complete the log in process. Consult your ISP to determine the sequence of events that occur during the log in process. Then modify this script accordingly. The following commands are available:
- 'Send': Sends the specified text to the remote. Enter up to 33 alphanumeric characters.
 - 'Send username': Sends the Local username (set on the Authentication page) to the remote.
 - 'Send password': Sends the Local password (set on the Authentication page) to the remote.
 - 'Wait for': Pauses script execution until the specified text is sent by the remote system. Enter up to 33 alphanumeric characters.
 - 'Delay': Pauses script execution for the specified number of seconds. Range: 1 to 255 seconds.
 - 'Timeout': If the next script event does not complete within the time specified, the script is aborted. Range: 1 to 255 seconds.
 - 'Abort': End the script.
8. Click 'Save', 'Finish', then 'Reset'.

TFTP interface

The TFTP interface lets you upload and download configuration files and firmware.

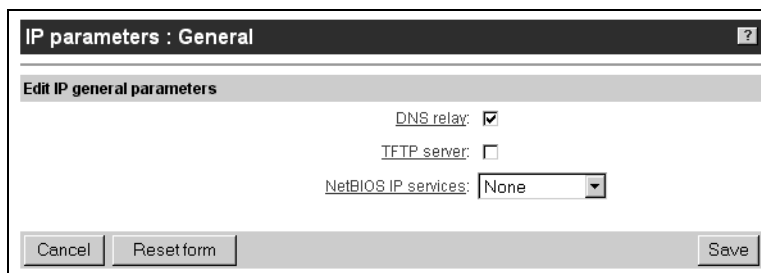
Prerequisites

General	Requires TFTP client software. A shareware client is included on the Diva LAN ISDN Modem CD.
Local access	IP connection via an Ethernet port. Support for TFTP server must be enabled.
Remote access	IP connection via ISDN. Remote management must be enabled. Support for incoming data calls must be enabled. Support for TFTP server must be enabled.

Enabling TFTP server support

To enable TFTP support via the web interface:

1. From the main menu, click 'Manual Configuration', then click 'IP', then 'General'.
2. Select the 'TFTP server' check box.



3. Click 'Save', then 'Reset'.

To enable TFTP support via the command line interface (CLI):

Note: For more information on the CLI, see the *Command Line Reference Guide*, included on the Diva CD-ROM.

1. Log into the CLI.
2. Enter the following commands to enable TFTP server support (press Enter after each line):

```
enable tftp server
save
```

Uploading/downloading configuration files

All configuration settings on the DIVA LAN ISDN Modem are stored in configuration files. Using TFTP, you can access these files to retrieve and set configuration values.

File Name	Access	Description
config.bat	Write-only	A file containing CLI commands. The commands in this file are automatically executed after being uploaded with TFTP. Trace commands are not supported by this file. Use trace.bat instead.
trace.bat	Write-only	Same as config.bat except that it supports trace commands.
result.txt	Read-only	Contains the results of the last .bat file that was executed.
config.all	Read-only	Contains the list of commands that define the current active configuration. Retrieve this file to view the entire configuration of the DIVA LAN ISDN Modem.
config.bin	Read/write	Contains a binary image of the current active configuration. You can download this file to backup the current configuration. (Download as a binary file.)
image.elm	Read/write	Contains the DIVA LAN ISDN Modem firmware. Write to this file to update the firmware. After writing is complete, a reset is automatically performed. Download this file to back up the firmware. (Download as a binary file.)
system.log	Read-only	The system log contains a record of a variety of events (trace data, connected/disconnected messages, security-related messages, warning and errors messages) that have occurred on the DIVA LAN ISDN Modem. The log can contain over 15000 entries before it wraps around.

Loading new firmware via TFTP

To upload new firmware to the Diva LAN ISDN Modem, use your TFTP client software to transfer the firmware file. For example, under Windows NT, you would issue the following command:

```
tftp -i 192.168.1.1 put NewImageFile image.elm
```

Where:

- **192.168.1.1** is the IP address of the Diva LAN ISDN Modem.
- **NewImageFile** is the name of the new Diva LAN ISDN Modem firmware file.
- **image.elm** is the target file name on the Diva LAN ISDN Modem (do not change it).

DTMF (Touch Telephone) Interface

The Diva LAN ISDN Modem enables you to set certain parameters using a standard touch-tone telephone.

Prerequisites

General	Touch-tone analog phone.
Local access	Phone must be plugged into phone port 2. ISDN line must not be connected.
Remote access	Not available.

How it works

Plug an analog phone into PHONE port 2 (make sure ISDN line is disconnected).

- Each command starts and ends with a #.
- A short beep indicates that the command you entered was accepted.
- Continuous beeping indicates that the command you entered was rejected. Enter # to start a new command and end the beeping.

Commands

The following commands are available.

Set primary ISDN telephone number	#TN1 <i>ISDN number</i> # Example: #8614078#	(#861 <i>ISDN number</i> #)
Set second ISDN telephone number	#TN2 <i>ISDN number</i> # Example: #8624079#	(#862 <i>ISDN number</i> #)
Set ISDN switch type	#STA# (#782#) Australia #STJ# (#785#) Japan #STE# (#783#) Euro-ISDN	
Save configuration and reset	#SA# (#72#)	
Reset to factory defaults	#RF# (#73#)	
Set LAN IP address	#IPxxx*xxx*xxx*xxx# Example: #47192*168*4*1#.	(#47xxx*xxx*xxx*xxx#)
Set LAN IP subnet mask	#SMxxx*xxx*xxx*xxx# Example: #76255*255*255*0#.	(#76xxx*xxx*xxx*xxx#)

Command Line Interface (CLI)

The command line interface provides you with access to all Diva LAN ISDN Modem parameters. Some advanced parameters are only accessible via this interface.

For information on accessing and using the command line interface, see the Command Line Reference Guide, included on the Diva CD-ROM.

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Regulatory Information for Europe



EU Declaration of Conformity

- EN:** Eicon Networks Corporation declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
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To receive a detailed R&TTE Declaration for this product please send a request specifying the product name to the following e-mail address: certification@eicon.com.

Safety Status: SELV

No voltages within this equipment exceed SELV voltages. All interconnection points and ports are SELV.

This equipment draws power from an external power supply which has been separately approved. It does not draw power from the ISDN network.

Power Consumption

Check that power supply will not be overloaded. Maximum power consumption of the unit is stated in [Specifications](#) on page 13. The user must ensure that the total power drawn by the host computer, the Diva LAN ISDN Modem, and any other peripherals, does not exceed the capability of the host power supply unit.

Limited Warranty

Eicon Networks Corporation warrants to the original purchaser of this Eicon Networks Product that it is to be in good working order for a period of five (5) years from the date of purchase from Eicon Networks Corporation or an authorized Eicon Networks dealer. Should this Product, in Eicon Networks Corporation's opinion, fail to be in good working order at any time during this five year warranty period, Eicon Networks Corporation will, at its option, repair or replace this Product at no additional charge except as set forth below. Repair parts and replacement Products will be furnished on an exchange basis and will be either reconditioned or new. This Limited Warranty does not include service to repair damage to the Product resulting from accident, disaster, misuse, abuse, or non-authorized alterations, modifications, and/or repairs.

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